华章科技

Linux/Unix
技术丛书

Python
自动化运维

技术与最佳实践

刘天斯　著

Automation Operations with Python
Technique and Best Practices

- 中国运维领域偶像级专家、腾讯高级系统工程师在天涯社区和腾讯近10年运维实践的经验和智慧结晶
- 不仅详尽介绍了服务监控、数据报表、系统安全等基础模块，而且深入讲解了自动化操作、系统管理、配置管理、集群管理及大数据应用等高级功能，包含4个完整的综合案例

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51CTO[illegible]LVS[illegible]Varnish[illegible]memlink[illegible]

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```
# python

Python 2.6.6 [illegible]r266[illegible]84292[illegible] Nov 22 2013[illegible] 12[illegible]16[illegible]22[illegible]

[GCC 4.4.7 20120313 [illegible]Red Hat 4.4.7-4[illegible]] on linux2

Type "help"[illegible] "copyright"[illegible] "credits" or "license" for more
information.

>>>
```

1.1 □□□□□□□□psutil

psutil□□□□□□□□http://code.google.com/p/psutil/□□□□□□□□□□□□□□□□□□□□□□□□□□CPU□□ps□top□lsof□netstat□ifconfig□who□df□kill□free□nice□ionice□iostat□iotop□uptime□pidof□tty□taskset□pmap□□□□□□32□□64□□Linux□Windows□OS X□FreeBSD□Sun Solaris□□□□□□□□□2.4□3.4□Python□□□□□□□□□□2.0.0□□□□□□□□□□□□□□□□□□□shell□□□□□□□□□□□□□□□□□□□□□□□shell□□□□□

```
□□□□total□□ free -m | grep Mem | awk '{print $2}'

□□□□used□□ free -m | grep Mem | awk '{print $3}'
```

□□□□□□□□psutil□□□□□□□□□□□psutil□□□□□□□□□□□□□□□

```
>>> import psutil

>>>mem = psutil.virtual_memory□□

>>>mem.total□mem.used

□506277888L□ 500367360L□
```

psutil[illegible]

```
#wget
https[illegible]//pypi.python.org/packages/source/p/psutil/psutil-
2.0.0.tar.gz --no-check-certificate

# tar -xzvf psutil-2.0.0.tar.gz

# cd psutil-2.0.0

# python setup.py install
```

1.1.1 [illegible]

[illegible]CPU[illegible]psutil[illegible]

[illegible]1[illegible]CPU[illegible]

Linux[illegible]CPU[illegible]

·User Time[illegible]

·System Time[illegible]

·Wait IO[illegible]IO[illegible]CPU[illegible]idle[illegible]

·Idle[illegible]CPU[illegible]idle[illegible]

□□□□Python□psutil.cpu_times□□□□□□□□□□□□□□□□□□□□□□□□□CPU□□□□□□□□□□CPU□□□□□□□□□□□□□□□□□□□□□□

```
>>> import psutil

>>>psutil.cpu_times□□#□□cpu_times□□□□CPU□□□□□□□□□□□□□CPU□□□

>>>#□□□□□□percpu=True□□□□psutil.cpu_times□percpu=True□

scputimes□user=38.039999999999999□ nice=0.01□
system=110.88□ idle=177062.59□ iowait=53.399999999999999□
irq=2.9100000000000001□ softirq=79.579999999999998□
steal=0.0□ guest=0.0□

>>>psutil.cpu_times□□.user    #□□□□□□□□□□□□user□CPU□□□

38.0

>>>psutil.cpu_count□□    #□□CPU□□□□□□□□logical=True4

>>>psutil.cpu_count□logical=False□    #□□CPU□□□□□

2

>>>
```

□2□□□□□

Linux□□□□□□□□□□□□total□□□□□□□used□□□□□□□□□□free□□□□□□□□buffers□□□□□□□□cache□□□□□□□□swap□□□□□□□□□□□□□□□psutil.virtual_memory□□□psutil.swap_memory□□□□□□□□□□□□□□□□□□□□□□

```
>>> import psutil

>>>mem = psutil.virtual_memory□□   #□□psutil.virtual_memory
□□□□□□□□□□

>>>mem

svmem□total=506277888L□ available=204951552L□ percent=59.5□
used=499867648L□ free=6410240L□ active=245858304□
inactive=163733504□ buffers=117035008L□ cached=81506304□

>>>mem.total    #□□□□□□

506277888L

>>>mem.free     #□□□□□□□

6410240L

>>>psutil.swap_memory□□    #□□SWAP□□□□sswap
□total=1073733632L□ used=0L□ free=1073733632L□ percent=0.0□
sin=0□ sout=0□

>>>
```

□3□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□IO□□□□□□□□□□□□psutil.disk_usage□□□□□□□IO□□□□read_count□□IO□□□write_count□□IO□□□read_bytes□IO□□□□□□write_bytes□IO□□□□□□read_time□□□□□□□□write_time□□□□□□□□□□□IO□□□□□□psutil.disk_io_counters□□□□□□□□□□□□□□□□

```
>>>psutil.disk_partitions□□    #□□psutil.disk_partitions□□□
□□□□□□□

[sdiskpart□device='/dev/sda1'□ mountpoint='/'□
fstype='ext4'□ opts='rw'□□ sdiskpart□device='/dev/sda3'□
mountpoint='/data'□ fstype='ext4'□ opts='rw'□]

>>>

>>>psutil.disk_usage□'/'□  #□□psutil.disk_usage□□□□□□□□□□□□
□□□

sdiskusage□total=15481577472□ used=4008087552□
free=10687057920□ percent=25.899999999999999□

>>>

>>>psutil.disk_io_counters□□    #□□psutil.disk_io_counters□
□□□□□IO□□□

                            #□□□□

sdiskio□read_count=9424□ write_count=35824□
read_bytes=128006144□ write_bytes=204312576□
read_time=72266□ write_time=182485□

>>>

>>>psutil.disk_io_counters□perdisk=True□  #“perdisk=True”□□
□□□□□□IO□□□

                                         #□□□□

{'sda2'□ sdiskio□read_count=322□ write_count=0□
read_bytes=1445888□ write_bytes=0□ read_time=445□
write_time=0□□ 'sda3'□ sdiskio□read_count=618□
write_count=3□ read_bytes=2855936□ write_bytes=12288□
read_time=871□ write_time=155□□ 'sda1'□ sdiskio
□read_count=8484□ write_count=35821□ read_bytes=123704320□
write_bytes=204300288□ read_time=70950□ write_time=182330□}
```

□4□□□□□

□□□□□□□□□□IO□□□□□□□□□□□□□bytes_sent□□□□□□□□bytes_recv=28220119□□□□□□□□packets_sent=200978□□□□□□□□□packets_recv=212672□□□□□□□□□□□□□□□□□□psutil.net_io_counters□□□□□□□□□□□□□□□□□□

```
>>>psutil.net_io_counters□□    #□□psutil.net_io_counters□□□
□□□IO□□□□

                               #□pernic=False

snetio□bytes_sent=27098178□ bytes_recv=28220119□
packets_sent=200978□ packets_recv=212672□ errin=0□
errout=0□ dropin=0□ dropout=0□

>>>psutil.net_io_counters□pernic=True□  #pernic=True□□□□□□
□□IO□□{'lo'□ snetio□bytes_sent=26406824□
bytes_recv=26406824□ packets_sent=198526□
packets_recv=198526□ errin=0□ errout=0□ dropin=0□
dropout=0□□ 'eth0'□ snetio□bytes_sent=694750□
bytes_recv=1816743□ packets_sent=2478□ packets_recv=14175□
errin=0□ errout=0□ dropin=0□ dropout=0□}

>>>
```

□5□□□□□□□

□□□□□□□□□□□□□□□□□□□□□psutil□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

```
>>>psutil.users□□    #□□psutil.users□□□□□□□□□□□□□□□□

[suser□name='root'□ terminal='pts/0'□ host='192.168.1.103'□
started=1394638720.0□□ suser□name='root'□ terminal='pts/1'□
host='192.168.1.103'□ started=1394723840.0□]

>>> import psutil□ datetime

>>>psutil.boot_time□□    #□□psutil.boot_time□□□□□□□□□□Linux
□□□□□□□

1389563460.0

>>>datetime.datetime.fromtimestamp□psutil.boot_time
□□□.strftime□"%Y-%m-%d %H□%M□%S"□

'2014-01-12 22□51□00'    #□□□□□□□□□
```

1.1.2 □□□□□□□□

□□□CPU□□□□□□□□□□IO□□□socket□□□

□1□□□□□

psutil□□□□□□□□□□□□□□□□□□□□□□□□□psutil.pids□□□□□□□□□□PID□□□psutil.Process□□

```
>>> import psutil

>>>psutil.pids□□   #□□□□□□PID

[1□ 2□ 3□ 4□ 5□ 6□ 7□ 8□ 9□ 10□ 11□ 12□ 13□ 14□ 15□ 16□ 17□
18□ 19……]
```

```
>>> p = psutil.Process□2424□  #□□□□□Process□□□□□□□□□PID

>>> p.name□□  #□□□

'java'

>>> p.exe□□  #□□bin□□

'/usr/java/jdk1.6.0_45/bin/java'

>>>p.cwd□□  #□□□□□□□□□□

'/usr/local/hadoop-1.2.1'

>>>p.status□□    #□□□□

'sleeping'

>>>p.create_time□□    #□□□□□□□□□□□□

1394852592.6900001

>>>p.uids□□    #□□uid□□

puids□real=0□ effective=0□ saved=0□

>>>p.gids□□    #□□gid□□

pgids□real=0□ effective=0□ saved=0□

>>>p.cpu_times□□    #□□CPU□□□□□□□user□system□□CPU□□

pcputimes□user=9.0500000000000007□ system=20.25□

>>>p.cpu_affinity□□    #get□□CPU□□□□□□□□□□CPU□□□□□CPU□□□□□□□

[0□ 1]

>>>p.memory_percent□□    #□□□□□□□

14.147714861289776

>>>p.memory_info□□    #□□□□rss□vms□□
```

```
pmem□rss=71626752□ vms=1575665664□

>>>p.io_counters□□    #□□IO□□□□□□□IO□□□□□

pio□read_count=41133□ write_count=16811□
read_bytes=37023744□ write_bytes=4722688□

>>>p.connections□□    #□□□□□□socket□namedutples□□□□□fs□
family□laddr

                      #□□□

[pconn□fd=65□ family=10□ type=1□ laddr=□'□□ffff□
192.168.1.20'□ 9000□□ raddr=□□□……]

>>>p.num_threads□□    #□□□□□□□□

33
```

□2□popen□□□□

psutil□□□popen□□

```
>>> import psutil

>>>from subprocess import PIPE

#□□psutil□Popen□□□□□□□□□□□□□□□□□□□□□□□□□□

>>> p = psutil.Popen□["/usr/bin/python"□ "-c"□ "print
□'hello'□"]□ stdout=PIPE□

>>>p.name□□

'python'

>>>p.username□□
```

```
'root'

>>>p.communicate□□

□'hello\n'□ None□

>>>p.cpu_times□□    #□□□□□□□CPU□□□□□□□□□□□□

pcputimes□user=0.01□ system=0.040000000000000001□
```

□□□□

·1.1.1□□□□□
https://github.com/giampaolo/psutil□

·1.1.1□□□□□□□□□
http://psutil.readthedocs.org/en/latest/□

1.2 □□□IP□□□□□□IPy

IP□□IP□□□□□□□□□□□□□□□□□□□□□□IP□□□□Python□□□□□□□□□□□□□IPy□https://github.com/haypo/python-ipy/□□□□□□□V0.81□IPy□□□□□□□□□□□□□□IP□□□□□□□□□□□□□□□

□□□IPy□□□□□□□□□□□□□□□□□□

```
# wget https□//pypi.python.org/packages/source/I/IPy/IPy-
0.81.tar.gz --no-check-certificate

# tar -zxvf IPy-0.81.tar.gz

# cd IPy-0.81

# python setup.py install
```

1.2.1 IP□□□□□□□□□□

IPy□□□□IP□□□□□□□□□□□□□□□□□□IPv6□IPv4□□□□□□□□□□□version□□□□□□□□IPv4□IPv6□□□

```
>>>IP□'10.0.0.0/8'□.version□□

4    #4□□IPv4□□

>>>IP□'□□1'□.version□□
```

```
6    #6□□IPv6□□
```

□□□□□□□□□□□□□IP□□□□□IP□□□□□□□□□□

```
from IPy import IP
ip = IP□'192.168.0.0/16'□
print ip.len□□    #□□192.168.0.0/16□□□IP□□
for x in ip□   #□□192.168.0.0/16□□□□□IP□□
    print□x□
```

□□□□□□□

```
65536
192.168.0.0
192.168.0.1
192.168.0.2
192.168.0.3
192.168.0.4
192.168.0.5
192.168.0.6
192.168.0.7
192.168.0.8
……
```

□□□□IP□□□□□□□□□□□□□□□□□□IP□□□IP□□□□

```
>>>from IPy import IP

>>>ip = IP□'192.168.1.20'□

>>>ip.reverseNames□□          #□□□□□□□□

['20.1.168.192.in-addr.arpa.']

>>>ip.iptype□□    #192.168.1.20□□□□□'PRIVATE'

>>> IP□'8.8.8.8'□.iptype□□    #8.8.8.8□□□□□

'PUBLIC'

>>> IP□"8.8.8.8"□.int□□       #□□□□□□□

134744072

>>> IP□'8.8.8.8'□.strHex□□    #□□□□□□□□□

'0x8080808'

>>> IP□'8.8.8.8'□.strBin□□    #□□□□□□□□

'00001000000010000000100000001000'

>>> print□IP□0x8080808□□      #□□□□□□IP□□

8.8.8.8
```

IP□□□□□□□□□□□□□□□□□IP□□□□□□□□□□□□□

```
>>>from IPy import IP

>>>print□IP□'192.168.1.0'□.make_net□'255.255.255.0'□□
```

```
192.168.1.0/24

>>>print□IP□'192.168.1.0/255.255.255.0'□
make_net=True□□

192.168.1.0/24

>>>print□IP□'192.168.1.0-192.168.1.255'□ make_net=True□□

192.168.1.0/24
```

□□□□□strNormal□□□□□□wantprefixlen□□□□□□□□□□□□□□□□□□□□□□□□□□□□

```
>>>IP□'192.168.1.0/24'□.strNormal□0□

'192.168.1.0'

>>>IP□'192.168.1.0/24'□.strNormal□1□

'192.168.1.0/24'

>>>IP□'192.168.1.0/24'□.strNormal□2□

'192.168.1.0/255.255.255.0'

>>>IP□'192.168.1.0/24'□.strNormal□3□

'192.168.1.0-192.168.1.255'
```

wantprefixlen□□□□□□□

·wantprefixlen=0□□□□□□192.168.1.0□

·wantprefixlen=1□prefix□□□□192.168.1.0/24□

·wantprefixlen=2□decimalnetmask□□□□192.168.1.0/255.255.255.0□

·wantprefixlen=3□lastIP□□□□192.168.1.0-192.168.1.255□

1.2.2 □□□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□prefixlen□□□□□□□□□□□□10.0.0.0/16□□□10.0.0.0/24□□□□□□□□□□prefixlen□□□□□□□□□□□□□□□□□□□□□10.0.0.0/16□□□192.0.0.0/16□IPy□□□□□□□□□□□□□□□□□IP□□□□□□□□□

```
>>>IP□'10.0.0.0/24'□ < IP□'12.0.0.0/24'□

True
```

□□IP□□□□□□□□□□□□□□□□□□□□

```
>>> '192.168.1.100' in IP□'192.168.1.0/24'□

True

>>>IP□'192.168.1.0/24'□ in IP□'192.168.0.0/16'□

True
```

□□□□□□□□□□□□□□□IPy□□□overlaps□□□□□

```
>>>IP□'192.168.0.0/23'□.overlaps□'192.168.1.0/24'□

1    #□□1□□□□□□

>>>IP□'192.168.1.0/24'□.overlaps□'192.168.2.0'□

0    #□□0□□□□□□□
```

□□ □□□□□IP□□□□□□□□□□□□□□□□□□□□□□□IP□□□□□□

```
#□/usr/bin/env python

from IPy import IP

ip_s = raw_input□'Please input an IP or net-range□ '□    #□
□□□□□□□□□IP□□□□□□□

ips = IP□ip_s□

if len□ips□ > 1□    #□□□□□□□

    print□'net□ %s' % ips.net□□□    #□□□□□□

    print□'netmask□ %s' % ips.netmask□□□    #□□□□□□□□

    print□'broadcast□ %s' % ips.broadcast□□□    #□□□□□□□□

    print□'reverse address□ %s' % ips.reverseNames□□[0]□
#□□□□□□□□

    print□'subnet□ %s' % len□ips□□    #□□□□□□□

else□    #□□□IP□□

    print□'reverse address□ %s' % ips.reverseNames□□[0]□
#□□IP□□□□

print□'hexadecimal□ %s' % ips.strHex□□□    #□□□□□□□□
```

```
print□'binary ip□ %s' % ips.strBin□□□    #□□□□□□

print□'iptype□ %s' % ips.iptype□□□    #□□□□□□□PRIVATE□
PUBLIC□LOOPBACK□
```

□□□□□□□IP□□□□□□□□□□□□

```
# python simple1.py

Please input an IP or net-range□ 192.168.1.0/24

net□ 192.168.1.0

netmask□ 255.255.255.0

broadcast□ 192.168.1.255

reverse address□ 1.168.192.in-addr.arpa.

subnet□ 256

hexadecimal□ 0xc0a80100

binaryip□ 11000000101010000000000100000000

iptype□ PRIVATE

# python simple1.py

Please input an IP or net-range□ 192.168.1.20

reverse address□ 20.1.168.192.in-addr.arpa.

hexadecimal□ 0xc0a80114

binaryip□ 11000000101010000000000100010100

iptype□ PRIVATE
```

[illegible]

·1.2.1[illegible]
https://github.com/haypo/python-ipy/[illegible]

·1.2.2[illegible]1[illegible]
http://blog.philippklaus.de/2012/12/ip-address-analysis-using-python/[illegible]
http://www.sourcecodebrowser.com/ipy/0.62/class_i_py_1_1_i_pint.html[illegible]IPy[illegible]

1.3 DNS□□□□dnspython

dnspython□http://www.dnspython.org/□□Python□□□□□DNS□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ZONE□□□□□□□TSIG□□□□□□□□□□□EDNS0□□□DNS□□□□□□□□□□□□□□□□□□□□□□□□DNS□□□□□□□□□□□□□□□□□□nslookup□dig□□□□□□□□□□□□□□□□□□□□□□□□□□

□□□□dnspython□□□□□□□□□□□□□□□□□□□□□□□1.9.4□□□□

```
# http□//www.dnspython.org/kits/1.9.4/dnspython-1.9.4.tar.gz

# tar -zxvf dnspython-1.9.4.tar.gz

# cd dnspython-1.9.4

# python setup.py install
```

1.3.1 □□□□□□□□□□

dnspython□□□□□□□□DNS□□□□□□□□□□□□□□□□□dnspython□□□□□DNS□□□□——resolver□□□□□query□□□□□□□□□□□□□query□□□□□□□□

```
query□self□ qname□ rdtype=1□ rdclass=1□ tcp=False□
source=None□ raise_on_no_answer=True□ source_port=0□
```

[illegible]qname[illegible]rdtype[illegible]RR[illegible]

·A[illegible]IP[illegible]

·MX[illegible]

·CNAME[illegible]

·NS[illegible]

·PTR[illegible]A[illegible]IP[illegible]

·SOA[illegible]SOA[illegible]

rdclass[illegible]IN[illegible]CH[illegible]HS[illegible]IN[illegible]tcp[illegible]TCP[illegible]False[illegible]source[illegible]source_port[illegible]IP[illegible]0[illegible]raise_on_no_answer[illegible]True[illegible]

1.3.2 [illegible]

[illegible]DNS[illegible]A[illegible]MX[illegible]NS[illegible]CNAME[illegible]dnspython[illegible]dns.resolver.query[illegible]DNS[illegible]DNS[illegible]

□1□A□□

□□A□□□□□□□□□

□/home/test/dnspython/simple1.py□

```
#□/usr/bin/env python

import dns.resolver

domain = raw_input□'Please input an domain□ '□    #□□□□□□

A = dns.resolver.query□domain□ 'A'□    #□□□□□□□A□□

for i in A.response.answer□    #□□response.answer□□□□□□□□□□

    for j in i.items□    #□□□□□□

        print j.address
```

□□□□□□□□□□□□www.google.com□□□□□

```
# python simple1.py

Please input an domain□ www.google.com

173.194.127.180

173.194.127.178

173.194.127.176

173.194.127.179

173.194.127.177
```

□2□MX□□

□□MX□□□□□□□□□

□/home/test/dnspython/simple2.py□

```
#□/usr/bin/env python

import dns.resolver

domain = raw_input□'Please input an domain□ '□

MX = dns.resolver.query□domain□ 'MX'□    #□□□□□□MX□□

for i in MX□    #□□□□□□□□MX□□□preference□exchanger□□

   print 'MX preference ='□ i.preference□ 'mail exchanger
='□ i.exchange
```

□□□□□□□□□□□□163.com□□□□□

```
# python simple2.py

Please input an domain□ 163.com

MX preference = 10 mail exchanger =
163mx03.mxmail.netease.com.

MX preference = 50 mail exchanger =
163mx00.mxmail.netease.com.

MX preference = 10 mail exchanger =
163mx01.mxmail.netease.com.

MX preference = 10 mail exchanger =
163mx02.mxmail.netease.com.
```

□3□NS□□

□□NS□□□□□□□□

□/home/test/dnspython/simple3.py□

```
#□/usr/bin/env python

import dns.resolver

domain = raw_input□'Please input an domain□ '□

ns = dns.resolver.query□domain□ 'NS'□    #□□□□□□□NS□□

for i in ns.response.answer□

   for j in i.items□

      print j.to_text□□
```

□□□□□□□□□□baidu.com□□□□□□□□□□□□□□www.baidu.com□□□□□□□

```
# python simple3.py

Please input an domain□ baidu.com

ns4.baidu.com.

dns.baidu.com.

ns2.baidu.com.

ns7.baidu.com.

ns3.baidu.com.
```

□4□CNAME□□

□□CNAME□□□□□□□□□

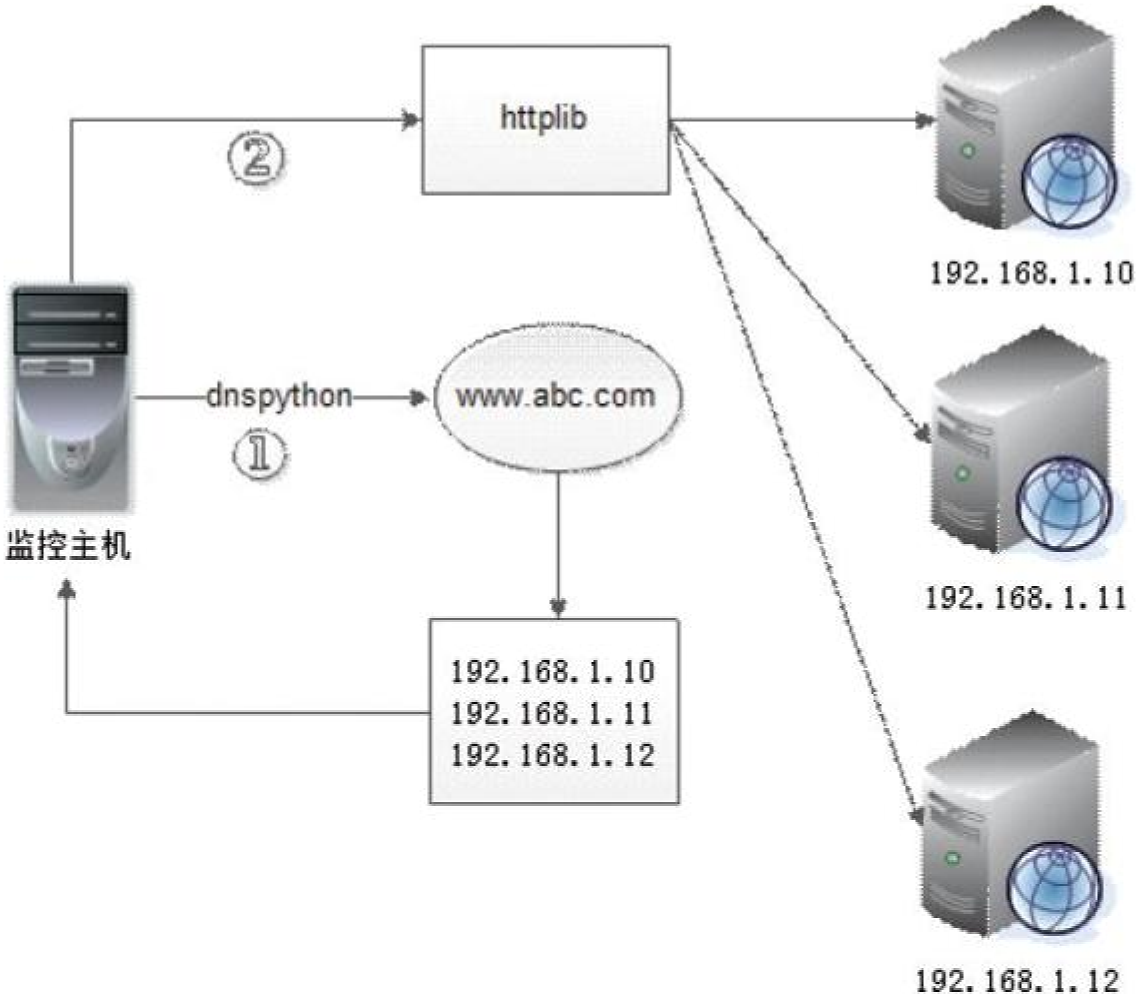
□/home/test/dnspython/simple4.py□

```
#□/usr/bin/env python

import dns.resolver

domain = raw_input□'Please input an domain□ '□

cname = dns.resolver.query□domain□ 'CNAME'□   #□□□□□□□CNAME
□□

for i in cname.response.answer□    #□□□□□cname□□□□□□

   for j in i.items□

      print j.to_text□□
```

□□□□□cname□□□□□□□

1.3.3 □□□DNS□□□□□□□□

□□□□DNS□□□□□□□□□□□□IP□□□□□□□DNS□□□□□□□□□□□□□□□□IP□□IP□□□□□□□□□□□□□□□□□□□□□□□□□□□□□IP□□□□□□□□□□□□□□□□□□□□□1-1□□□



□1-1　DNS□□□□□□□□□□□□

1.□□

1□□□□□□□□□□□□□□□□A□□□□IP□□□

2□□IP□□□□HTTP□□□□□□

2.□□□□

□□□□□□□□dns.resolver.query□□□□□□□□□□A□□□□□□□□□□IP□□□□□□□□httplib□□□request□□

□□□GET□□□□□□□□□□□□□□□□□□IP□□□□□□□ □/home/test/dnspython/simple5.py□

```
#□/usr/bin/python

import dns.resolver

import os

import httplib

iplist=[]    #□□□□IP□□□□

appdomain="www.google.com.hk"    #□□□□□□

def get_iplist□domain=""□□    #□□□□□□□□□□□IP□□□□□iplist

    try□

        A = dns.resolver.query□domain□ 'A'□    #□□A□□□□

    except Exception□e□

        print "dns resolver error□"+str□e□

        return

    for i in A.response.answer□

        for j in i.items□

            iplist.append□j.address□    #□□□iplist

    return True

def checkip□ip□□

    checkurl=ip+"□80"

    getcontent=""
    httplib.socket.setdefaulttimeout□5□    #□□http□□□□□□□5
□□

    conn=httplib.HTTPConnection□checkurl□    #□□http□□□□

    try□

        conn.request□"GET"□ "/"□headers = {"Host"□
appdomain}□  #□□URL□□□□


     #□host□□□

        r=conn.getresponse□□

        getcontent =r.read□15□   #□□URL□□□15□□□□□□□□□□□□

    finally□

        if getcontent=="<□doctype html>"□  #□□URL□□□□□□□□□□
□□□□□□

                                           #“HTTP200”□

            print ip+" [OK]"

        else□

            print ip+" [Error]"    #□□□□□□□□□□□□□□□□□□□

if __name__=="__main__"□

    if get_iplist□appdomain□ and len□iplist□>0□    #□□□□□□□
□□□□□□□□□IP

        for ip in iplist□

            checkip□ip□

    else□

        print "dns resolver error."
```

[illegible]crontab[illegible]

```
# python simple5.py

74.125.31.94 [OK]

74.125.128.199 [OK]

173.194.72.94 [OK]
```

[illegible]www.google.com.hk[illegible]3[illegible]IP[illegible]

[illegible]2[illegible] [illegible]

[illegible]Python[illegible]HTTP[illegible]

2.1 □□□□□□□□□□

□□□□□□□□difflib□□□□□□□□□□□□□difflib□□Python□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□HTML□□□□Linux□□diff□□□□□□□□□□□difflib□□□□□□□□□□□□□□□□□□□□□□□□□□Python 2.3□□□□□□□□□difflib□□□□□□□□□□□□□□□□□□□□□□□□□□□

2.1.1 □□1□□□□□□□□□□□

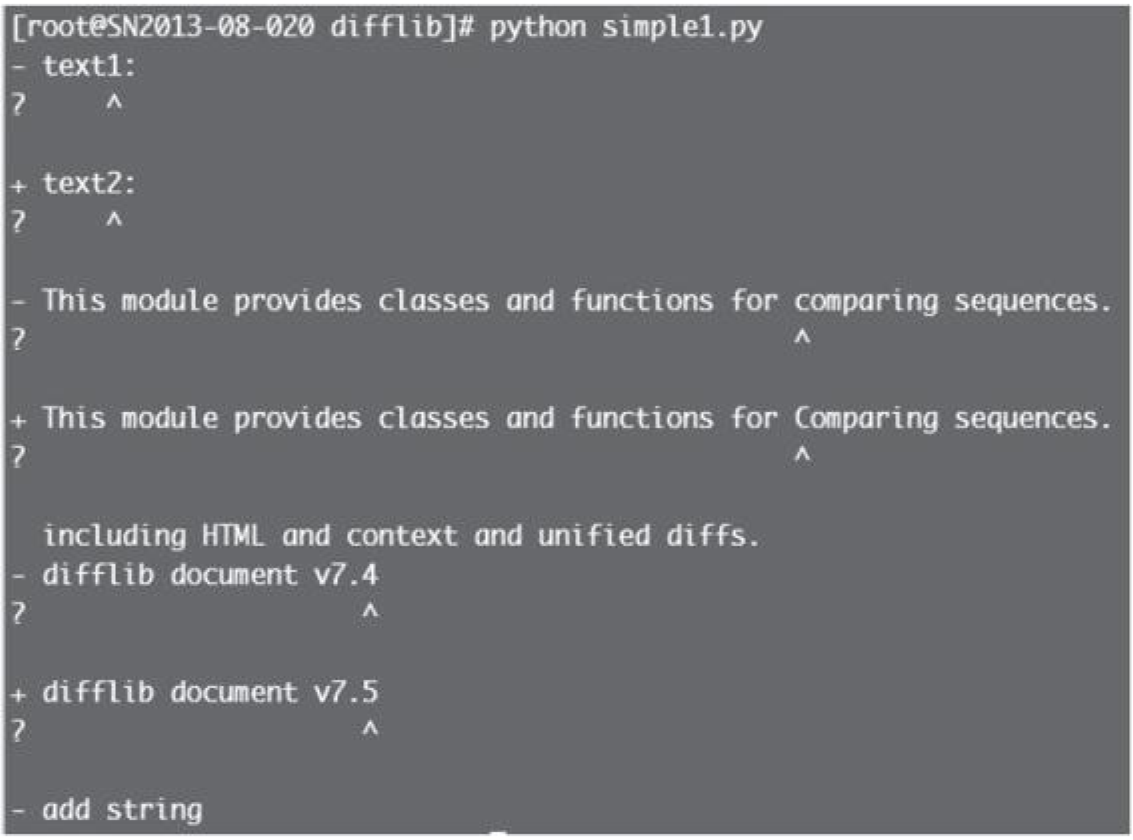
□□□□□□□difflib□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/home/test/difflib/simple1.py□

```
#□/usr/bin/python

import difflib

text1 = """text1□    #□□□□□1

This module provides classes and functions for comparing
sequences.

including HTML and context and unified diffs.

difflib document v7.4

add string

"""

text1_lines = text1.splitlines□□    #□□□□□□□□□□□□□
```

```
text2 = """text2□    #□□□□□2

This module provides classes and functions for Comparing
sequences.

including HTML and context and unified diffs.

difflib document v7.5"""

text2_lines = text2.splitlines□□

d = difflib.Differ□□    #□□Differ□□□□

diff = d.compare□text1_lines□ text2_lines□    # □□compare□□
□□□□□□□□

print '\n'.join□list□diff□□
```

□□□□□Differ□□□□□□□□□□□□□□□□difflib□SequenceMatcher□□□□□□□□□□□□□□□HtmlDiff□□□□□□□□□□□□□HTML□□□□□□□□□□□2-1□□□

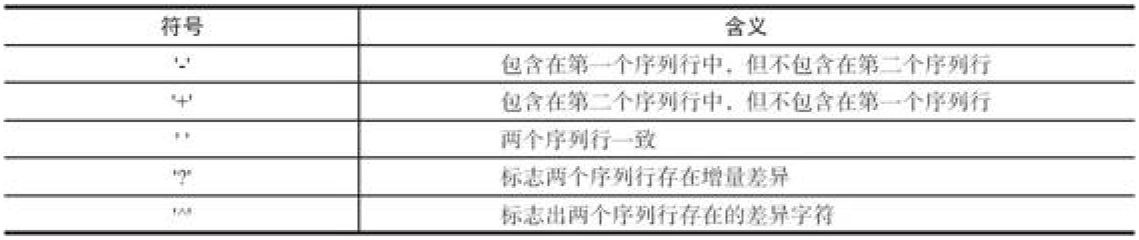


```
[root@SN2013-08-020 difflib]# python simple1.py
- text1:
?     ^

+ text2:
?     ^

- This module provides classes and functions for comparing sequences.
?                                                ^

+ This module provides classes and functions for Comparing sequences.
?                                                ^

  including HTML and context and unified diffs.
- difflib document v7.4
?                   ^

+ difflib document v7.5
?                   ^

- add string
```

□2-1　□□□□□□

□□□□□□□□□□□□□□□2-1□□□□□□□□□□□

□2-1　□□□□□□



符号	含义
'-'	包含在第一个序列行中，但不包含在第二个序列行
'+'	包含在第二个序列行中，但不包含在第一个序列行
' '	两个序列行一致
'?'	标志两个序列行存在增量差异
'^'	标志出两个序列行存在的差异字符

2.1.2　□□□□□□□HTML□□□□

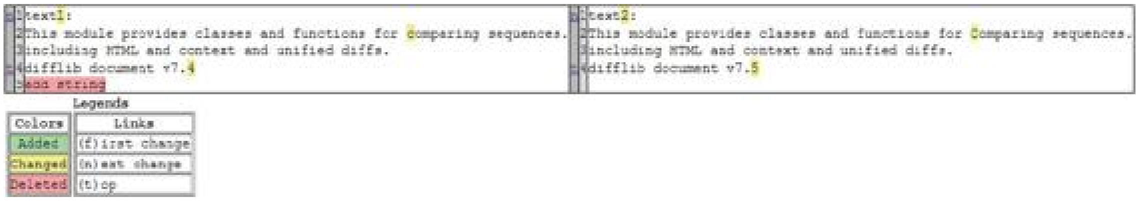
□□HtmlDiff□□□□make_file□□□□□□□□□□□□HTML□□□□□□□1□□□□□□□□□□□

```
d = difflib.Differ□□
diff = d.compare□text1_lines□ text2_lines□
print '\n'.join□list□diff□□
```

□□□□

```
d = difflib.HtmlDiff□□
print d.make_file□text1_lines□ text2_lines□
```

□□□□□□□simple2.py□□□# python simple2.py>diff.html□□□□□□□□□diff.html□□□□□□□□2-2□□□HTML□□□□□□□□□□□□□□□□□□□□□□□□□□□□



```
1 text1:                                                          1 text2:
2 This module provides classes and functions for comparing sequences.   2 This module provides classes and functions for Comparing sequences.
3 including HTML and context and unified diffs.                     3 including HTML and context and unified diffs.
4 difflib document v7.4                                             4 difflib document v7.5
5 add string
```

Colors	Links
Added	(f)irst change
Changed	(n)ext change
Deleted	(t)op

□2-2 □□□□□□□diff.html□□

2.1.3 □□2□□□Nginx□□□□□□

□□□□□□□Nginx□□difflib.HtmlDiff□□□□HTML□□□□□□□□□□□□□□□

□/home/test/difflib/simple3.py□

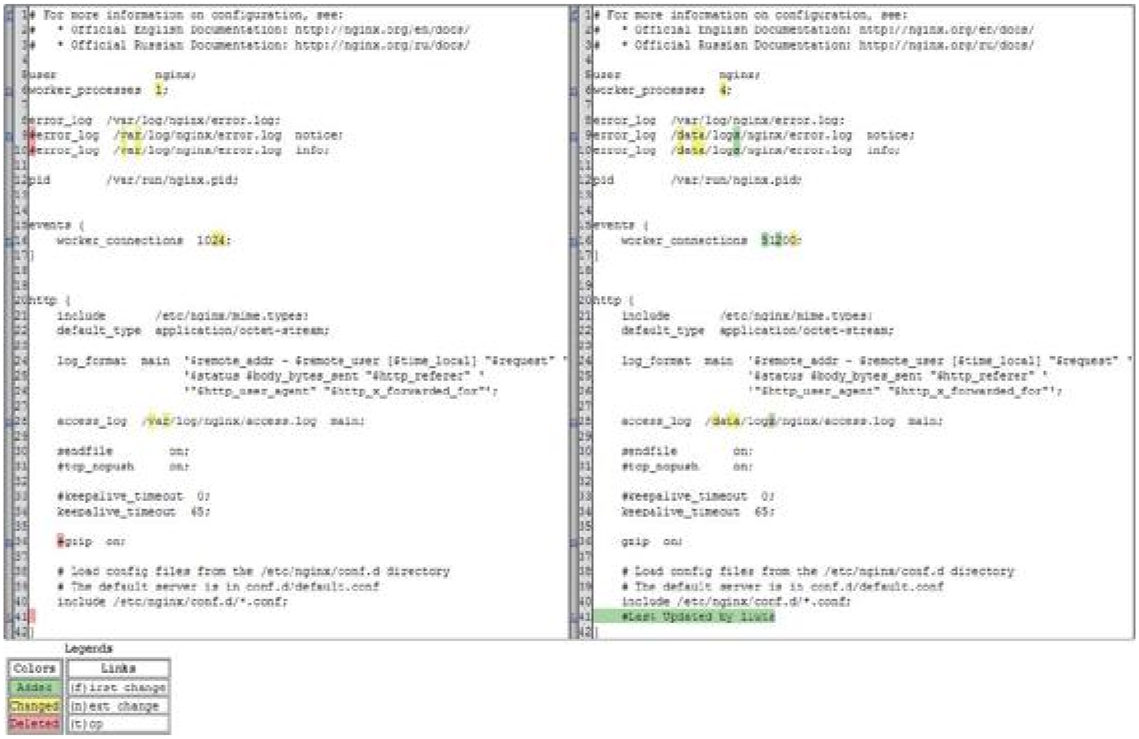
```
#□/usr/bin/python

import difflib

import sys

try□

    textfile1=sys.argv[1]    #□□□□□□□□□□□

    textfile2=sys.argv[2]    #□□□□□□□□□□□

except Exception□e□

    print "Error□"+str□e□

    print "Usage□ simple3.py filename1 filename2"

    sys.exit□□

def readfile□filename□□    #□□□□□□□□

    try□

        fileHandle = open □filename□ 'rb' □

        text=fileHandle.read□□.splitlines□□    #□□□□□□□□□

        fileHandle.close□□

        return text

    except IOError as error□

       print□'Read file Error□'+str□error□□

       sys.exit□□

if textfile1=="" or textfile2==""□

    print "Usage□ simple3.py filename1 filename2"
    sys.exit□□
text1_lines = readfile□textfile1□    #□□readfile□□□□□□□□□□□
□
text2_lines = readfile□textfile2□
d = difflib.HtmlDiff□□    #□□HtmlDiff□□□□□
print d.make_file□text1_lines□ text2_lines□    #□□make_file
□□□□HTML□□□□□□□
```

□□□□□□□

```
# python simple3.py nginx.conf.v1 nginx.conf.v2 > diff.html
```

□□2-3□□□□□nginx.conf.v1□nginx.conf.v2□□□□□□□□□□

□□□□   2.1□□□□□□□□□http://docs.python.org/2/library/difflib.html□



```
# For more information on configuration, see:
#   * Official English Documentation: http://nginx.org/en/docs/
#   * Official Russian Documentation: http://nginx.org/ru/docs/

user              nginx;
worker_processes  1;

error_log  /var/log/nginx/error.log;
#error_log  /var/log/nginx/error.log  notice;
#error_log  /var/log/nginx/error.log  info;

pid        /var/run/nginx.pid;


events {
    worker_connections  1024;
}


http {
    include       /etc/nginx/mime.types;
    default_type  application/octet-stream;

    log_format  main  '$remote_addr - $remote_user [$time_local] "$request" '
                      '$status $body_bytes_sent "$http_referer" '
                      '"$http_user_agent" "$http_x_forwarded_for"';

    access_log  /var/log/nginx/access.log  main;

    sendfile        on;
    #tcp_nopush     on;

    #keepalive_timeout  0;
    keepalive_timeout  65;

    #gzip  on;

    # Load config files from the /etc/nginx/conf.d directory
    # The default server is in conf.d/default.conf
    include /etc/nginx/conf.d/*.conf;

}
```

```
# For more information on configuration, see:
#   * Official English Documentation: http://nginx.org/en/docs/
#   * Official Russian Documentation: http://nginx.org/ru/docs/

user              nginx;
worker_processes  4;

error_log  /var/log/nginx/error.log;
error_log  /data/logs/nginx/error.log  notice;
error_log  /data/logs/nginx/error.log  info;

pid        /var/run/nginx.pid;


events {
    worker_connections  51200;
}


http {
    include       /etc/nginx/mime.types;
    default_type  application/octet-stream;

    log_format  main  '$remote_addr - $remote_user [$time_local] "$request" '
                      '$status $body_bytes_sent "$http_referer" '
                      '"$http_user_agent" "$http_x_forwarded_for"';

    access_log  /data/logs/nginx/access.log  main;

    sendfile        on;
    #tcp_nopush     on;

    #keepalive_timeout  0;
    keepalive_timeout  65;

    gzip  on;

    # Load config files from the /etc/nginx/conf.d directory
    # The default server is in conf.d/default.conf
    include /etc/nginx/conf.d/*.conf;
    #Last Updated by [illegible]
}
```

Legends

Colors	Links
Added	(f)irst change
Changed	(n)ext change
Deleted	(t)op

2.2 □□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Python□□□□□□□□□□□□□□□□□filecmp□filecmp□□□Python 2.3□□□□□□□□□filecmp□□□□□□□□□□□□□□□□□□□

2.2.1 □□□□□□□□

filecmp□□□□□□□□□□□□□cmp□□□□□□□□cmpfiles□□□□□□□□dircmp□□□□□□□□□□□□□□□□

- **□□□□□** □□□filecmp.cmp□f1□f2[□shallow]□□□□□□□□□f1□f2□□□□□□□□True□□□□□□False□shallow□□True□□□□□□□os.stat□□□shallow□False□□□os.stat□□□□□□□□□□□□□□

□□ □□□□□□□□□□

```
>>> filecmp.cmp
□"/home/test/filecmp/f1"□"/home/test/filecmp/f3"□

True
```

```
>>> filecmp.cmp
□"/home/test/filecmp/f1"□"/home/test/filecmp/f2"□

False
```

· □□□□□ □□□filecmp.cmpfiles□dir1□dir2□common[□shallow]□□□□□□dir1□dir2□□

□□ □dir1□dir2□□□□□□□□□□□□

□□□□□□□md5□□□□□□□f1□f2□□□□□f3□□□□f4□f5□□□□□□□□□□□□□□

```
[root@SN2013-08-020 dir2]# md5sum *

d9dfc198c249bb4ac341198a752b9458  f1

aa9aa0cac0ffc655ce9232e720bf1b9f  f2

33d2119b71f717ef4b981e9364530a39  f3

d9dfc198c249bb4ac341198a752b9458  f5

[root@SN2013-08-020 dir1]# md5sum *

d9dfc198c249bb4ac341198a752b9458  f1

aa9aa0cac0ffc655ce9232e720bf1b9f  f2

d9dfc198c249bb4ac341198a752b9458  f3

410d6a485bcf5d2d2d223f2ada9b9c52  f4
```

[illegible]cmpfiles[illegible]

```
>>>filecmp.cmpfiles
[illegible]"/home/test/filecmp/dir1"[illegible]"/home/test/filecmp/dir2"[illegible]
['f1'[illegible]'f2'[illegible]'f3'[illegible]'f4'[illegible]'f5'][illegible]

[illegible]['f1'[illegible] 'f2'][illegible] ['f3'][illegible] ['f4'[illegible] 'f5'][illegible]
```

· [illegible] [illegible]dircmp[illegible]a[illegible]b[[illegible]ignore[[illegible]hide]][illegible]a[illegible]b[illegible]ignore[illegible]['RCS'[illegible]'CVS'[illegible]'tags'][illegible]hide[illegible][os.curdir[illegible]os.pardir][illegible]dircmp[illegible]a[illegible]a[illegible]b[illegible]

dircmp[illegible]

·report[illegible]

·report_partial_closure[illegible]

·report_full_closure[illegible]

[illegible]dircmp[illegible]

·left[illegible]a[illegible]

·right[illegible]b[illegible]

·left_list□□□□□□□□□□□□□□

·right_list□□□□□□□□□□□□□□

·common□□□□□□□□□□□□□□□□

·left_only□□□□□□□□□□□□□□

·right_only□□□□□□□□□□□□□□

·common_dirs□□□□□□□□□□□□□

·common_files□□□□□□□□□□□□□

·common_funny□□□□□□□□□□□□□□□□□□□□
os.stat□□□□□□□□□

·same_files□□□□□□□□□

·diff_files□□□□□□□□

·funny_files□□□□□□□□□□□□□□□□□□□

·subdirs□□common_dirs□□□□□□□□dircmp□
□□□□□□□□□□

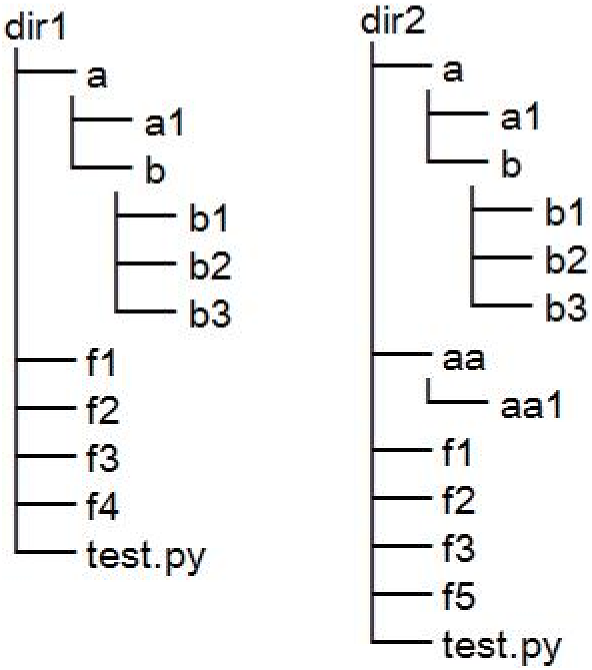
□□ □□□dir1□dir2□□□□□□

□□□□dircmp□□□□□□□□□□□□□□□□□□□□□□□□□□
□□□□□□

□/home/test/filecmp/simple1.py□

```
import filecmp

a="/home/test/filecmp/dir1"    #□□□□□

b="/home/test/filecmp/dir2"    #□□□□□

dirobj=filecmp.dircmp□a□b□['test.py']□    #□□□□□□□test.py□□

#□□□□□□□□□□□□□□□□□□filecmp□□□□□□□□

dirobj.report□□

dirobj.report_partial_closure□□

dirobj.report_full_closure□□

print "left_list□"+ str□dirobj.left_list□

print "right_list□"+ str□dirobj.right_list□

print "common□"+ str□dirobj.common□

print "left_only□"+ str□dirobj.left_only□

print "right_only□"+ str□dirobj.right_only□

print "common_dirs□"+ str□dirobj.common_dirs□

print "common_files□"+ str□dirobj.common_files□

print "common_funny□"+ str□dirobj.common_funny□

print "same_file□"+ str□dirobj.same_files□

print "diff_files□"+ str□dirobj.diff_files□

print "funny_files□"+ str□dirobj.funny_files□
```

□□□□□□□□□tree□□□□□□□□□□□□□□□□□2-4□□□



□2-4 □□tree□□□□□□□□□

□□□□□□□□□□□□□□□□

```
# python simple1.py

-------------------report---------------------

diff /home/test/filecmp/dir1 /home/test/filecmp/dir2

Only in /home/test/filecmp/dir1 □ ['f4']

Only in /home/test/filecmp/dir2 □ ['aa'□ 'f5']

Identical files □ ['f1'□ 'f2']

Differing files □ ['f3']

Common subdirectories □ ['a']

-------------report_partial_closure-----------

diff /home/test/filecmp/dir1 /home/test/filecmp/dir2
```

```
Only in /home/test/filecmp/dir1 ： ['f4']

Only in /home/test/filecmp/dir2 ： ['aa'， 'f5']

Identical files ： ['f1'， 'f2']

Differing files ： ['f3']

Common subdirectories ： ['a']

diff /home/test/filecmp/dir1/a /home/test/filecmp/dir2/a

Identical files ： ['a1']

Common subdirectories ： ['b']

-------------report_full_closure--------------

diff /home/test/filecmp/dir1 /home/test/filecmp/dir2

Only in /home/test/filecmp/dir1 ： ['f4']

Only in /home/test/filecmp/dir2 ： ['aa'， 'f5']

Identical files ： ['f1'， 'f2']

Differing files ： ['f3']

Common subdirectories ： ['a']

diff /home/test/filecmp/dir1/a /home/test/filecmp/dir2/a

Identical files ： ['a1']

Common subdirectories ： ['b']

diff /home/test/filecmp/dir1/a/b
/home/test/filecmp/dir2/a/b

Identical files ： ['b1'， 'b2'， 'b3']

left_list：['a'， 'f1'， 'f2'， 'f3'， 'f4']

right_list：['a'， 'aa'， 'f1'， 'f2'， 'f3'， 'f5']
```

```
common□['a'□ 'f1'□ 'f2'□ 'f3']

left_only□['f4']

right_only□['aa'□ 'f5']

common_dirs□['a']

common_files□['f1'□ 'f2'□ 'f3']

common_funny□[]

same_file□['f1'□ 'f2']

diff_files□['f3']

funny_files□[]
```

2.2.2 □□□□□□□□□□□□□

□□□filecmp□□□left_only□diff_files□□□□□□□□□□□□□□□□□shutil.copyfile□os.makedirs□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/home/test/filecmp/simple2.py□

```
#□/usr/bin/env python

import os□ sys

import filecmp

import re
import shutil

holderlist=[]

def compareme□dir1□ dir2□□    #□□□□□□□□□

    dircomp=filecmp.dircmp□dir1□dir2□

    only_in_one=dircomp.left_only    #□□□□□□□□□

    diff_in_one=dircomp.diff_files    #□□□□□□□□□□□□□□□□

    dirpath=os.path.abspath□dir1□    #□□□□□□□□□

    #□□□□□□□□□□□□holderlist

    [holderlist.append□os.path.abspath□os.path.join□dir1□
x□□□ for x in only_in_one]

    [holderlist.append□os.path.abspath□os.path.join□dir1□
x□□□ for x in diff_in_one]

    if len□dircomp.common_dirs□ > 0□    #□□□□□□□□□□□□□□□□

        for item in dircomp.common_dirs□    #□□□□□

            compareme□os.path.abspath□os.path.join□dir1□
item□□□ \

            os.path.abspath□os.path.join□dir2□item□□□

        return holderlist

def main□□□

    if len□sys.argv□ > 2□    #□□□□□□□□□□□□

        dir1=sys.argv[1]

        dir2=sys.argv[2]

    else□

        print "Usage□ "□ sys.argv[0]□ "datadir backupdir"
        sys.exit□□

    source_files=compareme□dir1□dir2□    #□□□□□□□□□□

    dir1=os.path.abspath□dir1□

    if not dir2.endswith□'/'□□ dir2=dir2+'/'    #□□□□□□
□“/”□

    dir2=os.path.abspath□dir2□

    destination_files=[]

    createdir_bool=False

    for item in source_files□    #□□□□□□□□□□□□□□

        destination_dir=re.sub□dir1□ dir2□ item□    #□□□□□□
□□□□□□□□□

                                                    #□□□□

        destination_files.append□destination_dir□

        if os.path.isdir□item□□    #□□□□□□□□□□□□□□□□□□□□□□□

            if not os.path.exists□destination_dir□□

                os.makedirs□destination_dir□

                createdir_bool=True    #□□□□compareme□□□□

    if createdir_bool□    #□□□□compareme□□□□□□□□□□□□□□□

        destination_files=[]

        source_files=[]

        source_files=compareme□dir1□dir2□    #□□compareme□□

        for item in source_files□    #□□□□□□□□□□□□□□□□□□□□□

            destination_dir=re.sub□dir1□ dir2□ item□
            destination_files.append□destination_dir□

    print "update item□"

    print source_files    #□□□□□□□□□

    copy_pair=zip□source_files□destination_files□    #□□□□□
□□□□□□□□□□□□□

    for item in copy_pair□

        if os.path.isfile□item[0]□□    #□□□□□□□□□□□□□□□□

            shutil.copyfile□item[0]□ item[1]□

if __name__ == '__main__'□

    main□□
```

□□□□□dir1□□f4□code/f3□□□□□□□□□□□□□

```
# python simple2.py /home/test/filecmp/dir1
/home/test/filecmp/dir2

update item□

['/home/test/filecmp/dir1/f4'□
'/home/test/filecmp/dir1/code/f3']

# python simple2.py /home/test/filecmp/dir1
/home/test/filecmp/dir2

update item□

[]     #□□□□□□□□□□□□□□
```

□□□□

·2.2.1□□□□□□□□□http://docs.python.org/2/library/filecmp.html□

·2.2.2□□□□□http://linuxfreelancer.com/how-do-you-compare-two-folders-and-copy-the-difference-to-a-third-folder□

2.3 □□□□□□□□smtplib

□□□Python□smtplib□□□□□□□□□□□□□□□□□smtp□□□□□□□smtp□□□□□□□□□□□□□□□□□□□□□□Foxmail□□□□□□□□□□□□□□□□□□□□□smtp□□□□□□□□□□□□□□□□Python 2.3□□□□□□□□□smtplib□□□□□□□□□□□□□□□□□□□

2.3.1 smtplib□□□□□□□□

SMTP□□□□smtplib.SMTP□[host[□port[□local_hostname[□timeout]]]]□□□□SMTP□□□□□□□□□□□smtp□□□host□□□□□smtp□□□□□□□smtp.163.com□port□□□□□□□□□25□local_hostname□□□□□□□□□□FQDN□□□□□□□□□HELO/EHLO□□□□□□□□□□□timeout□□□□□□□□□□□□□SMTP□□□□□□□□

·SMTP.connect□[host[□port]]□□□□□□□□smtp□□□□□host□□□□□□□□port□□□□□smtp□□□□□25□□□□□□□□host□port□□□□□□□□□SMTP.connect□“smtp.163.com”□“25”□□

·SMTP.login□user□password□□□□□□smtp□□□□□□□□□□□□□□□□□□□SMTP.login□“python_2014@163.com”□“sdjkg358”□□

·SMTP.sendmail□from_addr□to_addrs□msg[□mail_options□rcpt_options]□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□SMTP.sendmail□“python_2014@163.com”□“demo@domail.com”□body□□□□body□□□□□□□

```
"""From□ python_2014@163.com

To□ demo@domail.com

Subject□ test mail

test mail body"""
```

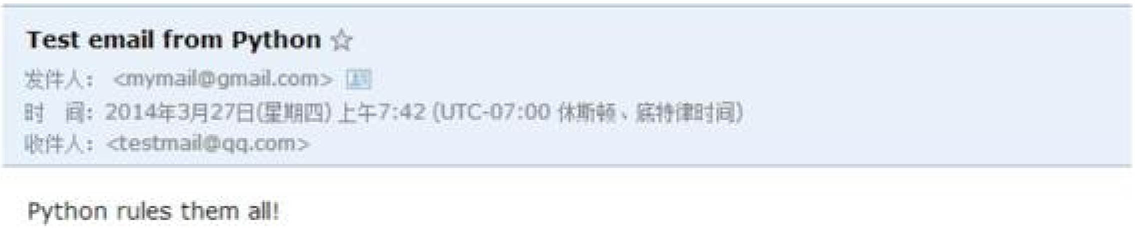
·SMTP.starttls□[keyfile[□certfile]]□□□□□□TLS□□□□□□□□□□□SMTP□□□□□□□□□□□□□gmail□smtp□□□□□□□□□□□□□□□□□□□SMTP.starttls□□□

·SMTP.quit□□□□□□□smtp□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□gmail□QQ□□□□□□□□□□□□□□

```
#□/usr/bin/python
import smtplib
import string
HOST = "smtp.gmail.com"    #□□smtp□□
SUBJECT = "Test email from Python"    #□□□□□□
TO = "testmail@qq.com"    #□□□□□□□
FROM = "mymail@gmail.com"    #□□□□□□□
text = "Python rules them all□"    #□□□□
BODY = string.join□□    #□□sendmail□□□□□□□□□□□□□"\r\n"□□□□
        "From□ %s" % FROM□
        "To□ %s" % TO□
        "Subject□ %s" % SUBJECT □
        ""□
        text
        □□ "\r\n"□
server = smtplib.SMTP□□    #□□□□SMTP□□□□
server.connect□HOST□"25"□    #□□connect□□□□smtp□□
server.starttls□□    #□□□□□□□□
server.login□"mymail@gmail.com"□"mypassword"□    #□□□□□□□□
server.sendmail□FROM□ [TO]□ BODY□    #□□□□
server.quit□□    #□□smtp□□
```

□□□□□□□□□□□□□□□2-5□□□



Test email from Python ☆

发件人：<mymail@gmail.com>

时　间：2014年3月27日(星期四) 上午7:42 (UTC-07:00 休斯顿、底特律时间)

收件人：<testmail@qq.com>

Python rules them all!

□2-5　□□□□□

2.3.2　□□□□□□□□□□□□

□□HTML□□□□□□□□□□□□□□MIME□Multipurpose Internet Mail Extensions□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□MIME□□□http://zh.wikipedia.org/wiki/MIME□□□□□□□Python□□□□MIME□□□□

·email.mime.multipart.MIMEMultipart□[_subtype[□boundary[□_subparts[□_params]]]]□□□□□□□□□□□□□□□□□□MIME□□□□□_subtype□□□□□□□"Content-type□multipart/subtype"□□□□□□□□□□□□□□□mixed□related□alternative□□□□□mixed□□□mixed□□□□□□□□□□□□□□□□related□□□□□□□□□□□□□□□alternative□□□□□□□□□□□□□□□□□□□

·email.mime.audio.MIMEAudio□_audiodata[□_subtype[□_encoder[□

**_params]]]□□□□□□□□□□□□□□□□_audiodata
□□□□□□□□□□□□□□□□□□

·email.mime.image.MIMEImage
□_imagedata[□_subtype[□_encoder[□
**_params]]]□□□□□□□□□□□□□□□□_imagedata
□□□□□□□□□□□□□□□□

·email.mime.text.MIMEText□_text[□
_subtype[□_charset]]□□□□□□□□□□□□□□□
_text□□□□□□□□□□□□_subtype□□□□□□□□□
plain□□□□□□html□□□□□□□

2.3.3 □□□□□□□□□□□□

□□□□□□□□Python□smtplib□email□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□email.mime□□□smtplib□□□□□□□□□□□□□□□□□□□□□□□□□□□□HTML□□□□□□□□□□□□□□□□□smtplib□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

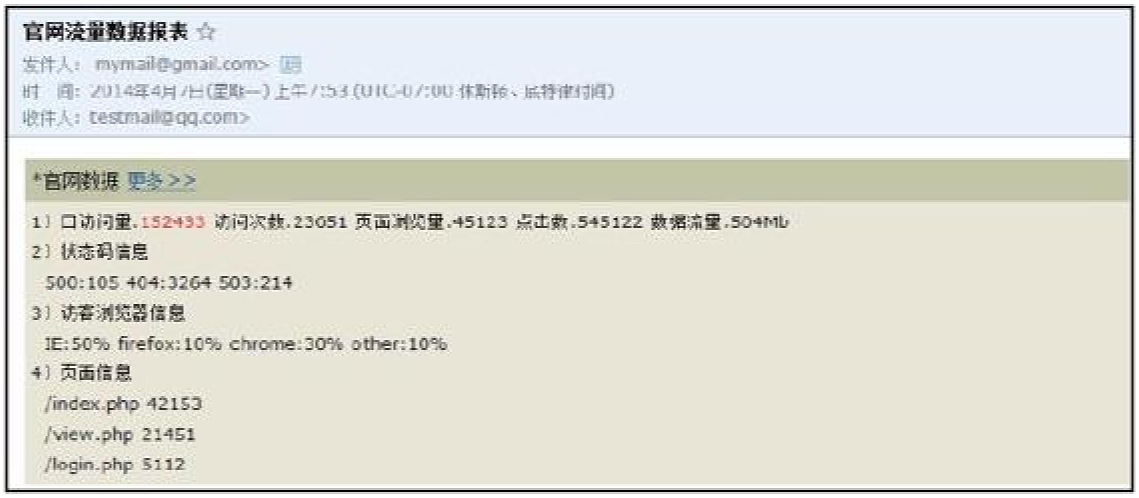
□□1 □□□HTML□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□email.mime□MIMEText□□□□□□HTML□□□□□□□□□□HTML□□□□□□□□□□□□□□CSS□□□□□□□□□□□□HTML□□□□□□□□□□□□□□□□□□□□□□

□/home/test/smtplib/simple2.py□

```
#coding□ utf-8

import smtplib

from email.mime.text import MIMEText    #□□MIMEText□

HOST = "smtp.gmail.com"    #□□smtp□□

SUBJECT = u"□□□□□□□□"    #□□□□□□

TO = "testmail@qq.com"    #□□□□□□□

FROM = "mymail@gmail.com"    #□□□□□□□

msg = MIMEText□"""    #□□□□MIMEText□□□□□□□HTML□□□□□□□□□
html□□□

                      #□□□

    <table width="800" border="0" cellspacing="0"
cellpadding="4">

      <tr>

        <td bgcolor="#CECFAD" height="20"duokan-code-cn">□
14px">*□□□□  <a href="monitor.domain.com">□□>></a></td>

      </tr>

      <tr>

        <td bgcolor="#EFEBDE" height="100"duokan-code-cn">□
13px">

        1□□□□□□<font color=red>152433</font>  □□□□□23651 □□
□□□□45123 □□□□545122  □□□□□504Mb<br>

        2□□□□□□<br>

        &nbsp□&nbsp□500□105  404□3264  503□214<br>
        3□□□□□□□□<br>
        &nbsp□&nbsp□IE□50%  firefox□10% chrome□30% other□10%<br>
        4□□□□□<br>
        &nbsp□&nbsp□/index.php 42153<br>
        &nbsp□&nbsp□/view.php 21451<br>
        &nbsp□&nbsp□/login.php 5112<br>
        </td>
      </tr>
    </table>"""□"html"□"utf-8"□
msg['Subject'] = SUBJECT    #□□□□
msg['From']=FROM    #□□□□□□□□□□□□
msg['To']=TO    #□□□□□□□□□□□□
try□
    server = smtplib.SMTP□□    #□□□□SMTP□□□□
    server.connect□HOST□"25"□    #□□connect□□□□smtp□□
    server.starttls□□    #□□□□□□□□
    server.login□"mymail@gmail.com"□"mypassword"□    #□□□□□□□□
    server.sendmail□FROM□ TO□ msg.as_string□□□    #□□□□
    server.quit□□    #□□smtp□□
    print "□□□□□□□"
except Exception□ e□
    print "□□□"+str□e□
```

□□□□□□□□2-6□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□



官网流量数据报表 ☆
发件人： mymail@gmail.com>
时　间：2014年4月7日(星期一) 上午7:53 (UTC-07:00 休斯顿、底特律时间)
收件人：testmail@qq.com>

*官网数据 更多>>

1）口访问量.152433 访问次数.23051 页面浏览量.45123 点击数.545122 数据流量.504Mb
2）状态码信息
500:105 404:3264 503:214
3）访客浏览器信息
IE:50% firefox:10% chrome:30% other:10%
4）页面信息
/index.php 42153
/view.php 21451
/login.php 5112

□2-6　□□1□□□□

□□2 □□□□□□□□□□□□□□□□□□

□□1□□MIMEText□□□□HTML□□□□□□□□□□□□□□□□□□□□□□□□□□MIMEImage□□□□□□□□□□MIME□□□□□□□□□□□MIMEMultipart□□□□□□□□□□□□MIMEText□MIMEImage□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/home/test/smtplib/simple3.py□

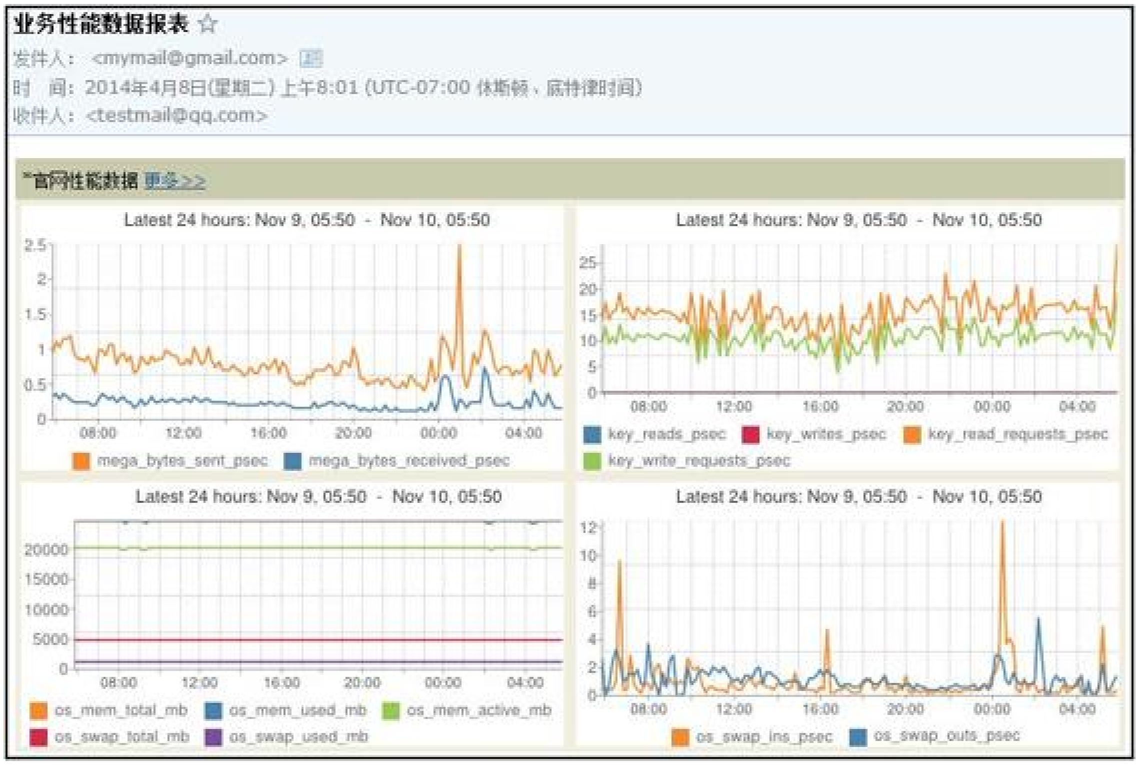
```
#coding□ utf-8

import smtplib

from email.mime.multipart import MIMEMultipart    #□□
MIMEMultipart□
```

```
from email.mime.text import MIMEText    #□□MIMEText□

from email.mime.image import MIMEImage    #□□MIMEImage□

HOST = "smtp.gmail.com"    #□□smtp□□

SUBJECT = u"□□□□□□□□"    #□□□□□□

TO = "testmail@qq.com"    #□□□□□□□

FROM = "mymail@gmail.com"    #□□□□□□□

def addimg□src□imgid□□    #□□□□□□□□□1□□□□□□□□2□□□id

    fp = open□src□ 'rb'□    #□□□□

    msgImage = MIMEImage□fp.read□□□    #□□MIMEImage□□□□□□□□
□□□□□□

    fp.close□□    #□□□□

    msgImage.add_header□'Content-ID'□ imgid□    #□□□□□□□
Content-ID□<img>

                                                #□□src□□

    return msgImage    #□□msgImage□□

msg = MIMEMultipart□'related'□    #□□MIMEMultipart□□□□□
related□□□□□□

                                    #□□□□

msgtext = MIMEText□"""    #□□□□MIMEText□□□HTML□□□□□□<table>
□□□<img>

<table width="600" border="0" cellspacing="0"
cellpadding="4">

      <tr bgcolor="#CECFAD" height="20"duokan-code-cn">□
14px">

        <td colspan=2>*□□□□□□  <a
href="monitor.domain.com">□□>></a></td>
```

```
      </tr>

      <tr bgcolor="#EFEBDE" height="100"duokan-code-cn">□
13px">

        <td>

         <img src="cid□io"></td><td>

         <img src="cid□key_hit"></td>

      </tr>

      <tr bgcolor="#EFEBDE" height="100"duokan-code-cn">□
13px">

         <td>

         <img src="cid□men"></td><td>

         <img src="cid□swap"></td>

      </tr>

    </table>"""□"html"□"utf-8"□    #<img>□□□src□□□□□
Content-ID□□□□

msg.attach□msgtext□    #MIMEMultipart□□□□MIMEText□□□

msg.attach□addimg□"img/bytes_io.png"□"io"□□    #□□
MIMEMultipart□□□□MIMEImage

                                               #□□□

msg.attach□addimg□"img/myisam_key_hit.png"□"key_hit"□□

msg.attach□addimg□"img/os_mem.png"□"men"□□

msg.attach□addimg□"img/os_swap.png"□"swap"□□

msg['Subject'] = SUBJECT    #□□□□

msg['From']=FROM    #□□□□□□□□□□□□
```

```
msg['To']=TO    #□□□□□□□□□□□□

try□

    server = smtplib.SMTP□□    #□□□□SMTP□□□□

    server.connect□HOST□"25"□    #□□connect□□□□smtp□□

    server.starttls□□    #□□□□□□□□

    server.login□"mymail@gmail.com"□"mypassword"□    #□□□□□
□□□

    server.sendmail□FROM□ TO□ msg.as_string□□□    #□□□□

    server.quit□□    #□□smtp□□

    print "□□□□□□□"

except Exception□ e□

    print "□□□"+str□e□
```

□□□□□□□□2-7□□


业务性能数据报表 ☆

发件人：<mymail@gmail.com>

时　间：2014年4月8日(星期二) 上午8:01 (UTC-07:00 休斯顿、底特律时间)

收件人：<testmail@qq.com>

□2-7　□□2□□□□

□□3 □□□□□□□□□□□□□□□□

□□□□MIMEText□MIMEImage□□□□□□□□□□□□□□□MIMEText□□□□Content-Disposition□□

□/home/test/smtplib/simple4.py□

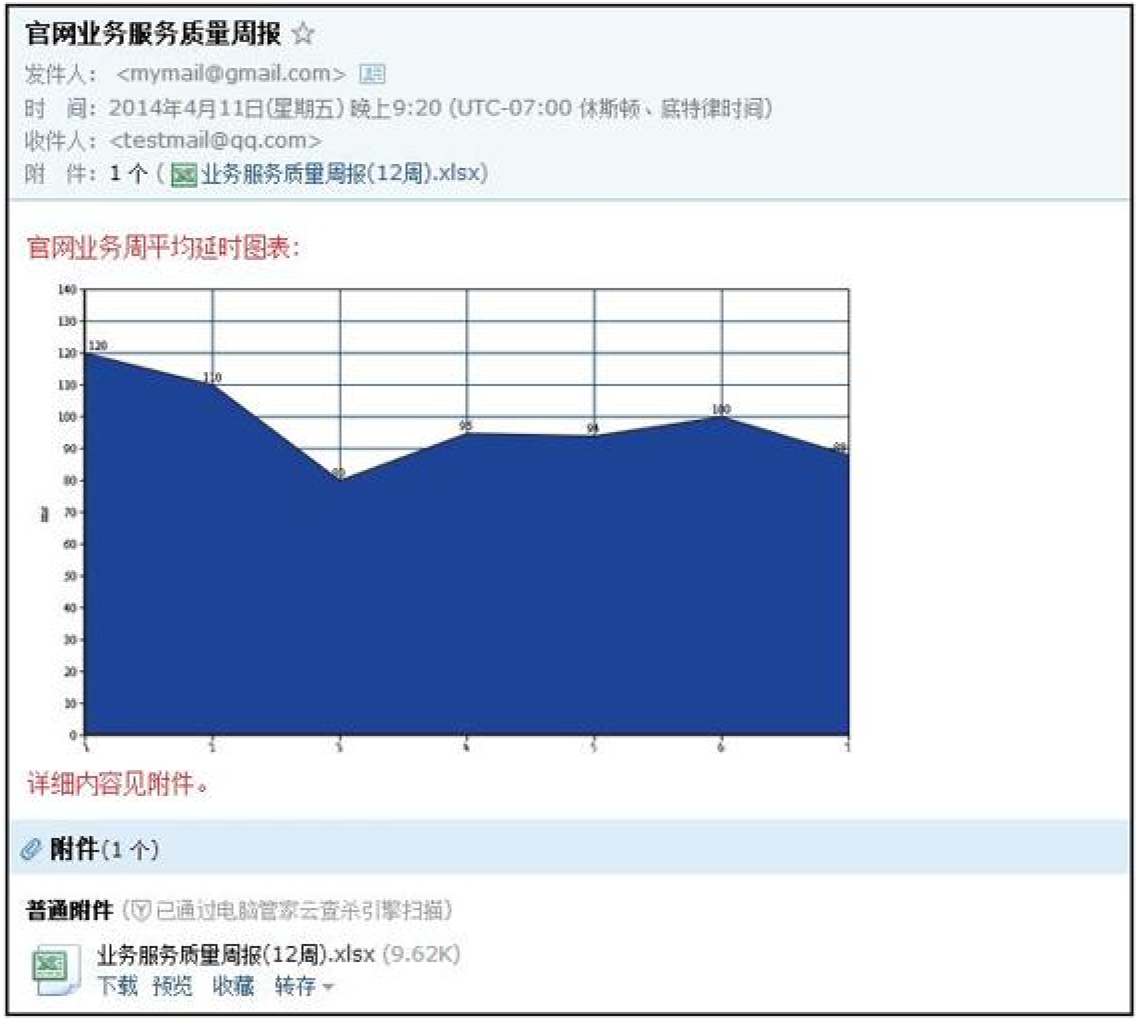
```
#coding□ utf-8

import smtplib

from email.mime.multipart import MIMEMultipart    #□□
MIMEMultipart□
```

```
from email.mime.text import MIMEText    #□□MIMEText□

from email.mime.image import MIMEImage    #□□MIMEImage□

HOST = "smtp.gmail.com"    #□□smtp□□

SUBJECT = u"□□□□□□□□□□"    #□□□□□□

TO = "testmail@qq.com"    #□□□□□□□

FROM = "mymail@gmail.com"    #□□□□□□□

def addimg□src□imgid□□    #□□□□□□□□□1□□□□□□□□2□□□id

    fp = open□src□ 'rb'□    #□□□□

    msgImage = MIMEImage□fp.read□□□    #□□MIMEImage□□□□□□□□
□□□□□

    fp.close□□    #□□□□

    msgImage.add_header□'Content-ID'□ imgid□    #□□□□□□□
Content-ID□<img>

                                                    #□□src□□

    return msgImage    #□□msgImage□□

msg = MIMEMultipart□'related'□    #□□MIMEMultipart□□□□□
related□□□□□□

                                    #□□□□

#□□□□MIMEText□□□HTML□□□□□□□□□<img>

msgtext = MIMEText□"<font color=red>□□□□□□□□□□□□<br><img
src=\"cid□weekly\" border=\"1\"><br>□□□□□□□□
</font>"□"html"□"utf-8"□

msg.attach□msgtext□    #MIMEMultipart□□□□MIMEText□□□

msg.attach□addimg□"img/weekly.png"□"weekly"□□    #□□
MIMEMultipart□□□□
```

```
                                                 #
MIMEImage□□□

#□□□□MIMEText□□□□□week_report.xlsx□□

attach = MIMEText□open□"doc/week_report.xlsx"□ "rb"□.read
□□□ "base64"□ "utf-8"□

attach["Content-Type"] = "application/octet-stream"    #□□□
□□□□□

#□□Content-Disposition□□attachment□□□□□□□□□□□□□□□□□□□□□

#filename□□

#□□qqmail□□gb18030□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

attach["Content-Disposition"] = "attachment□ filename=\"□□□
□□□□□□12□□.xlsx\"".decode□"utf-8"□.encode□"gb18030"□

msg.attach□attach□    #MIMEMultipart□□□□MIMEText□□□□

msg['Subject'] = SUBJECT    #□□□□

msg['From']=FROM    #□□□□□□□□□□□□

msg['To']=TO    #□□□□□□□□□□□□

try□

    server = smtplib.SMTP□□    #□□□□SMTP□□□□

    server.connect□HOST□"25"□    #□□connect□□□□smtp□□

    server.starttls□□    #□□□□□□□□

    server.login□"mymail@gmail.com"□"mypassword"□    #□□□□□
□□□

    server.sendmail□FROM□ TO□ msg.as_string□□□    #□□□□

    server.quit□□    #□□smtp□□

    print "□□□□□□□"
```

```
except Exception□ e□
    print "□□□"+str□e□
```

□□□□□□□□2-8□□□□□□□□□□□□□□□□□□□□□□



官网业务服务质量周报 ☆

发件人： <mymail@gmail.com>

时　间：2014年4月11日(星期五) 晚上9:20 (UTC-07:00 休斯顿、底特律时间)

收件人：<testmail@qq.com>

附　件：1 个 (业务服务质量周报(12周).xlsx)

官网业务周平均延时图表：

详细内容见附件。

附件(1 个)

普通附件 (已通过电脑管家云查杀引擎扫描)

业务服务质量周报(12周).xlsx (9.62K)

□2-8　□□3□□□□□

□□□□

·2.3.1[illegible]smtplib[illegible]
https://docs.python.org/2.7/library/smtplib.html[illegible]

·2.3.2[illegible]email.mime[illegible]
https://docs.python.org/2.7/library/email.mime.html[illegible]

2.4 [illegible]Web[illegible]

pycurl[illegible]http://pycurl.sourceforge.net[illegible]C[illegible]libcurl Python[illegible]FTP[illegible]HTTP[illegible]HTTPS[illegible]TELNET[illegible]Linux[illegible]curl[illegible]Python[illegible]pycurl[illegible]Web[illegible]HTTP[illegible]HTTP[illegible]

pycurl[illegible]

```
easy_install pycurl    #easy_install[illegible]

pip install pycurl    #pip[illegible]

#[illegible]

# [illegible]curl-config[illegible]curl

# wget http[illegible]//curl.haxx.se/download/curl-7.36.0.tar.gz

# tar -zxvf curl-7.36.0.tar.gz

# cd curl-7.36.0

# ./configure

# make && make install

# export LD_LIBRARY_PATH=/usr/local/lib

#

# wget
https[illegible]//pypi.python.org/packages/source/p/pycurl/pycurl-
```

```
7.19.3.1.tar.gz --no-check-certificate

# tar -zxvf pycurl-7.19.3.1.tar.gz

# cd pycurl-7.19.3.1

# python setup.py install --curl-
config=/usr/local/bin/curl-config
```

[illegible]

```
>>> import pycurl

>>> pycurl.version

'PycURL/7.19.3.1 libcurl/7.36.0 OpenSSL/1.0.1e zlib/1.2.3'
```

2.4.1 [illegible]

pycurl.Curl[illegible]libcurl[illegible]Curl[illegible]libcurl[illegible]http://curl.haxx.se/libcurl/c/libcurl-tutorial.html[illegible]Curl[illegible]

·close[illegible]libcurl[illegible]curl_easy_cleanup[illegible]Curl[illegible]

·perform[illegible]libcurl[illegible]curl_easy_perform[illegible]Curl[illegible]

·setopt[illegible]option[illegible]value[illegible]libcurl[illegible]curl_easy_setopt[illegible]option[illegible]libcurl[illegible]

□□□□□□□value□□□□□option□□□

```
c = pycurl.Curl□□    #□□□□curl□□

c.setopt□pycurl.CONNECTTIMEOUT□ 5□    #□□□□□□□□□□□0□□□□

c.setopt□pycurl.TIMEOUT□ 5□    #□□□□□□

c.setopt□pycurl.NOPROGRESS□ 0□    #□□□□□□□□□□□0□□□

c.setopt□pycurl.MAXREDIRS□ 5□    #□□HTTP□□□□□□□

c.setopt□pycurl.FORBID_REUSE□ 1□    #□□□□□□□□□□□□□□□

c.setopt□pycurl.FRESH_CONNECT□1□    #□□□□□□□□□□□□□□□□□□

c.setopt□pycurl.DNS_CACHE_TIMEOUT□60□    #□□□□DNS□□□□□□□□□
120□

c.setopt□pycurl.URL□"http□//www.baidu.com"□    #□□□□□URL

c.setopt□pycurl.USERAGENT□"Mozilla/5.2 □compatible□ MSIE
6.0□ Windows NT 5.1□ SV1□ .NET CLR 1.1.4322□ .NET CLR
2.0.50324□"□    #□□□□HTTP□□User-Agent

c.setopt□pycurl.HEADERFUNCTION□ getheader□  #□□□□HTTP
HEADER□□□□□□□getheader

c.setopt□pycurl.WRITEFUNCTION□ getbody□    #□□□□□□□□□□□□□
getbody

c.setopt□pycurl.WRITEHEADER□ fileobj□     #□□□□HTTP HEADER□
□□fileobj□□□□

c.setopt□pycurl.WRITEDATA□ fileobj□    #□□□□HTML□□□□□
fileobj□□□□
```

·getinfo□option□□□□□□libcurl□□□curl_easy_getinfo□□□□□option□□□libcurl□□□□□□□□□□□□□□□□□□□□

```
c = pycurl.Curl□□    #□□□□curl□□
c.getinfo□pycurl.HTTP_CODE□    #□□□HTTP□□□
c.getinfo□pycurl.TOTAL_TIME□    #□□□□□□□□□□□
c.getinfo□pycurl.NAMELOOKUP_TIME□    #DNS□□□□□□□□
c.getinfo□pycurl.CONNECT_TIME□    #□□□□□□□□□□
c.getinfo□pycurl.PRETRANSFER_TIME□    #□□□□□□□□□□□□□□□□
c.getinfo□pycurl.STARTTRANSFER_TIME□    #□□□□□□□□□□□□□□□
c.getinfo□pycurl.REDIRECT_TIME□    #□□□□□□□□□
c.getinfo□pycurl.SIZE_UPLOAD□    #□□□□□□□
c.getinfo□pycurl.SIZE_DOWNLOAD□    #□□□□□□□
c.getinfo□pycurl.SPEED_DOWNLOAD□    #□□□□□□
c.getinfo□pycurl.SPEED_UPLOAD□    #□□□□□□
c.getinfo□pycurl.HEADER_SIZE□    #HTTP□□□□
```

□□□□libcurl□□□□□□□□□□□□□□Web□□□□□□□□

2.4.2 □□□□□□□Web□□□□

HTTP□□

□□□□□□□□□□□□□□404□□□□□□500□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□CGI□□□□□□□□□pycurl□setopt□getinfo□□□□HTTP□□□□□□□□□□□□URL□□□HTTP□□□□HTTP□□□□□pycurl.HTTP_CODE□□□□□□□□HTTP□□□□□□□□□□□□□□□□□□□□pycurl.NAMELOOKUP_TIME□pycurl.CONNECT_TIME□pycurl.PRETRANSFER_TIME□pycurl.R□□□□□□□□□□□pycurl.WRITEHEADER□pycurl.WRITEDATA□□□□□□URL□HTTP□□□□□□□□□□□□□□□□□

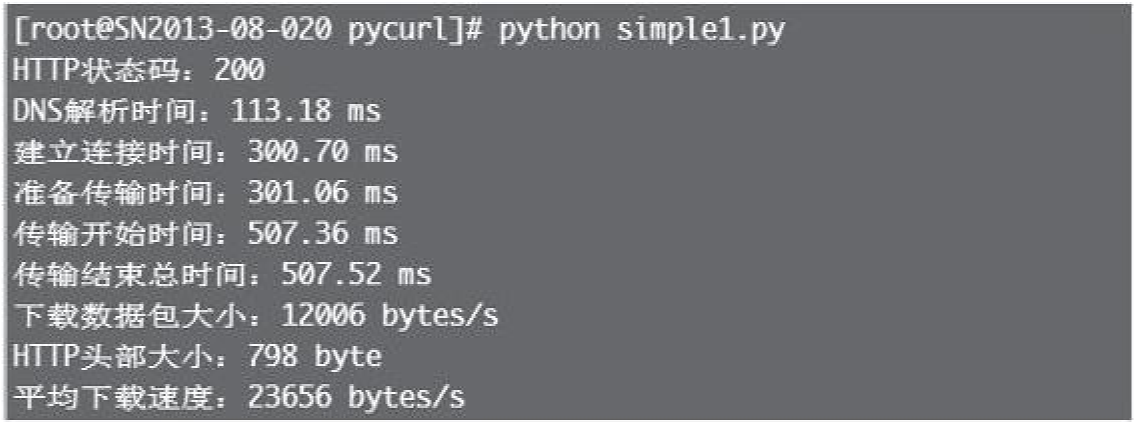
□/home/test/pycurl/simple1.py□

```
# -*- coding□ utf-8 -*-

import os□sys

import time

import sys

import pycurl

URL="http□//www.google.com.hk"    #□□□□□URL

c = pycurl.Curl□□    #□□□□Curl□□

c.setopt□pycurl.URL□ URL□    #□□□□□URL□□

c.setopt□pycurl.CONNECTTIMEOUT□ 5□    #□□□□□□□□□□□

c.setopt□pycurl.TIMEOUT□ 5□    #□□□□□□□□

c.setopt□pycurl.NOPROGRESS□ 1□    #□□□□□□□
```

```
c.setopt□pycurl.FORBID_REUSE□ 1□    #□□□□□□□□□□□□□□□

c.setopt□pycurl.MAXREDIRS□ 1□    #□□HTTP□□□□□□□□1

c.setopt□pycurl.DNS_CACHE_TIMEOUT□30□    #□□□□DNS□□□□□□30□

#□□□□□□□□□□”wb”□□□□□□□□□□□□http□□□□□□□

indexfile = open□os.path.dirname□os.path.realpath
□__file__□□+"/content.txt"□ "wb"□

c.setopt□pycurl.WRITEHEADER□ indexfile□    #□□□□HTTP HEADER
□□□indexfile□□□□

c.setopt□pycurl.WRITEDATA□ indexfile□    #□□□□HTML□□□□□
indexfile□□□□

try□

    c.perform□□    #□□□□

except Exception□e□

    print "connecion error□"+str□e□

    indexfile.close□□

    c.close□□

    sys.exit□□

NAMELOOKUP_TIME =  c.getinfo□c.NAMELOOKUP_TIME□    #□□DNS□□
□□

CONNECT_TIME =  c.getinfo□c.CONNECT_TIME□    #□□□□□□□□

PRETRANSFER_TIME =   c.getinfo□c.PRETRANSFER_TIME□    #□□□□
□□□□□□□□□□

                                                         #□□□□

STARTTRANSFER_TIME = c.getinfo□c.STARTTRANSFER_TIME□    #□□
□□□□□□□□□□□
```

```
#□□□□

TOTAL_TIME = c.getinfo□c.TOTAL_TIME□    #□□□□□□□□

HTTP_CODE =  c.getinfo□c.HTTP_CODE□    #□□HTTP□□□

SIZE_DOWNLOAD =  c.getinfo□c.SIZE_DOWNLOAD□    #□□□□□□□□□

HEADER_SIZE = c.getinfo□c.HEADER_SIZE□    #□□HTTP□□□□

SPEED_DOWNLOAD=c.getinfo□c.SPEED_DOWNLOAD□    #□□□□□□□□

#□□□□□□□□

print "HTTP□□□□%s" %□HTTP_CODE□

print "DNS□□□□□%.2f ms"%□NAMELOOKUP_TIME*1000□

print "□□□□□□□%.2f ms" %□CONNECT_TIME*1000□

print "□□□□□□□%.2f ms" %□PRETRANSFER_TIME*1000□

print "□□□□□□□%.2f ms" %□STARTTRANSFER_TIME*1000□

print "□□□□□□□□%.2f ms" %□TOTAL_TIME*1000□

print "□□□□□□□□%d bytes/s" %□SIZE_DOWNLOAD□

print "HTTP□□□□□%d byte" %□HEADER_SIZE□

print "□□□□□□□%d bytes/s" %□SPEED_DOWNLOAD□

#□□□□□Curl□□

indexfile.close□□

c.close□□
```

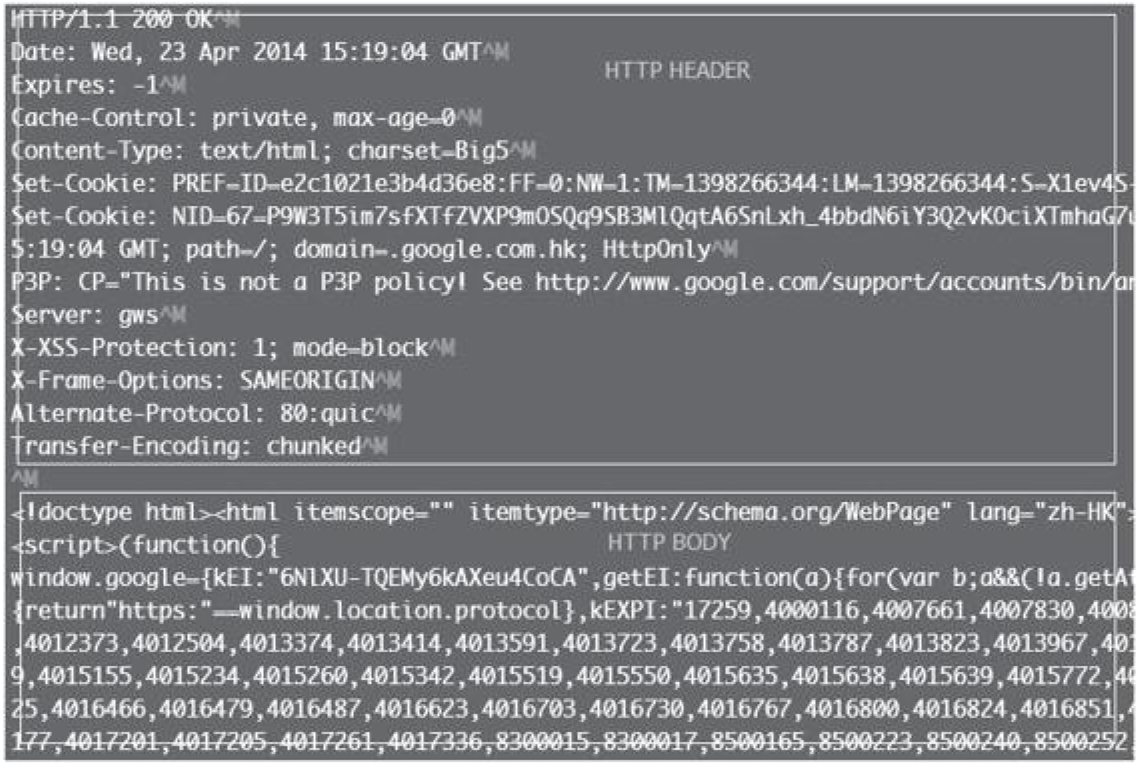
□□□□□□□□□□2-9□□□



```
[root@SN2013-08-020 pycurl]# python simple1.py
HTTP状态码：200
DNS解析时间：113.18 ms
建立连接时间：300.70 ms
准备传输时间：301.06 ms
传输开始时间：507.36 ms
传输结束总时间：507.52 ms
下载数据包大小：12006 bytes/s
HTTP头部大小：798 byte
平均下载速度：23656 bytes/s
```

[illegible]2-9 [illegible]Web[illegible]

[illegible]HTTP[illegible]content.txt[illegible]2-10[illegible]



```
HTTP/1.1 200 OK^M
Date: Wed, 23 Apr 2014 15:19:04 GMT^M
Expires: -1^M
Cache-Control: private, max-age=0^M
Content-Type: text/html; charset=Big5^M
Set-Cookie: PREF=ID=e2c1021e3b4d36e8:FF=0:NW=1:TM=1398266344:LM=1398266344:S=X1ev4S
Set-Cookie: NID=67=P9W3T5im7sfXTfZVXP9mOSQq9SB3MlQqtA6SnLxh_4bbdN6iY3Q2vKOciXTmhaG7
5:19:04 GMT; path=/; domain=.google.com.hk; HttpOnly^M
P3P: CP="This is not a P3P policy! See http://www.google.com/support/accounts/bin/a
Server: gws^M
X-XSS-Protection: 1; mode=block^M
X-Frame-Options: SAMEORIGIN^M
Alternate-Protocol: 80:quic^M
Transfer-Encoding: chunked^M
^M
<!doctype html><html itemscope="" itemtype="http://schema.org/WebPage" lang="zh-HK"
<script>(function(){
window.google={kEI:"6NlXU-TQEMy6kAXeu4CoCA",getEI:function(a){for(var b;a&&(!a.getA
{return"https:"==window.location.protocol},kEXPI:"17259,4000116,4007661,4007830,400
,4012373,4012504,4013374,4013414,4013591,4013723,4013758,4013787,4013823,4013967,40
9,4015155,4015234,4015260,4015342,4015519,4015550,4015635,4015638,4015639,4015772,4
25,4016466,4016479,4016487,4016623,4016703,4016730,4016767,4016800,4016824,4016851,
177,4017201,4017205,4017261,4017336,8300015,8300017,8500165,8500223,8500240,8500252
```

[illegible]2-10 content.txt[illegible]

[illegible]

·2.4.1[illegible]pycurl[illegible]http://pycurl.sourceforge.net/doc/index.html[illegible]

[illegible]3[illegible] [illegible]

[illegible]Excel[illegible]rrdtool[illegible]scapy[illegible]

3.1 [illegible]Excel[illegible]

Excel[illegible]Python[illegible]Excel[illegible]XlsxWriter[illegible]https://xlsxwriter.readthedocs.org[illegible]XlsxWriter[illegible]

·100%[illegible]Excel XLSX[illegible]Excel 2003[illegible]Excel 2007[illegible]

·[illegible]Excel[illegible]

·[illegible]

·[illegible]PNG[illegible]JPEG[illegible]

·[illegible]

XlsxWriter[illegible]

```
# pip install XlsxWriter    #pip[illegible]

# easy_install XlsxWriter    #easy_install[illegible]

#[illegible]

# curl -O -L
http[illegible]//github.com/jmcnamara/XlsxWriter/archive/master.tar.g
```

```
z

# tar zxvf master.tar.gz

# cd XlsxWriter-master/

# sudo python setup.py install
```

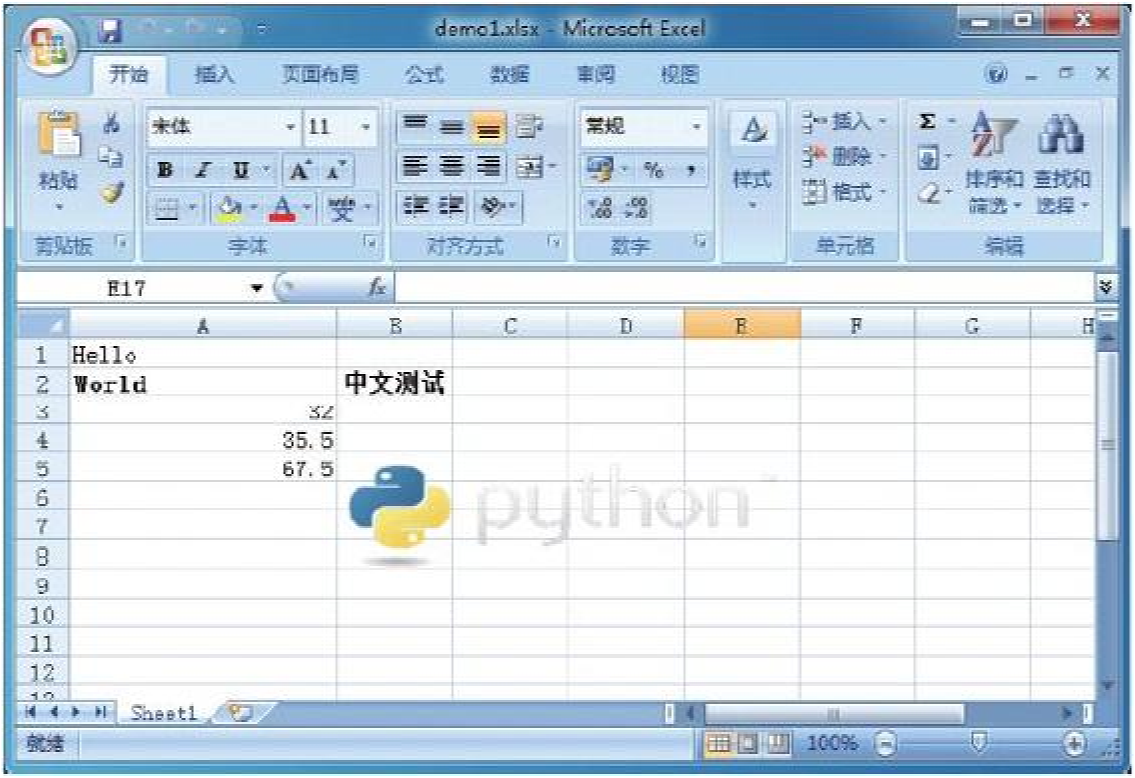
□□

□/home/test/XlsxWriter/simple1.py□

```
#coding□ utf-8

import xlsxwriter

workbook = xlsxwriter.Workbook□'demo1.xlsx'□    #□□□□Excel□
□

worksheet = workbook.add_worksheet□□    #□□□□□□□□□

worksheet.set_column□'A□A'□ 20□    #□□□□□□A□□□□20□□

bold = workbook.add_format□{'bold'□ True}□    #□□□□□□□□□□□

worksheet.write□'A1'□ 'Hello'□    #A1□□□□□'Hello'

worksheet.write□'A2'□ 'World'□ bold□    #A2□□□□□'World'□□□□
□□□□□bold

worksheet.write□'B2'□ u'□□□□□'□ bold□    #B2□□□□□□□□□□□□□□□□
bold

worksheet.write□2□ 0□ 32□    #□□□□□□□□□□□'32'□'35.5'

worksheet.write□3□ 0□ 35.5□    #□□□□□□□□□□□□0□□□□□□'3□0'□□
□'A3'

worksheet.write□4□ 0□ '=SUM□A3□A4□'□    #□A3□A4□□□□□□□□□'4□
```

```
0'□□'A5'

worksheet.insert_image□'B5'□ 'img/python-logo.png'□    #□B5
□□□□□□□

workbook.close□□    #□□Excel□□
```

□□□□□demo1.xlsx□□□□□□3-1□□□



	A	B
1	Hello	
2	**World**	**中文测试**
3	32	
4	35.5	
5	67.5	

□3-1 demo1.xlsx□□□□

3.1.1 □□□□□□□□

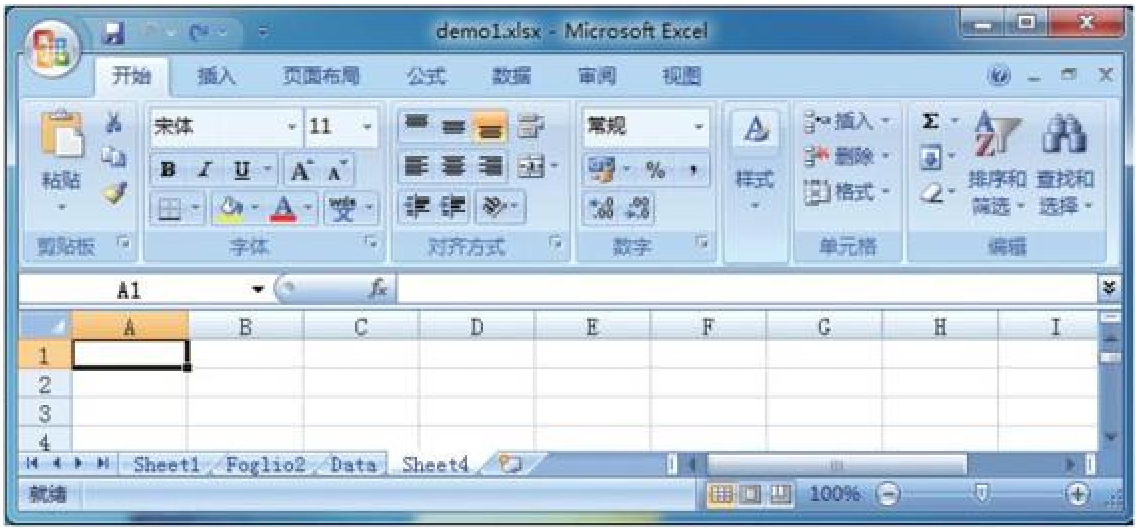
1.Workbook□

Workbook□□□□Workbook□filename[□options]□□□□□□□□□□XlsxWriter□Workbook□

□□Workbook□□□□□□□□□□□□□□□□□□□□□□filename□String□□□□□□□Excel□□□□□□□□□options□Dict□□□□□□□Workbook□□□□□□□□□□□□□□□□□□□□□□{'strings_to_numbers'□True}□□□□worksheet.write□□□□□□□□□□□□□□□

·add_worksheet□[sheetname]□□□□□□□□□□□□□□□□□□□sheetname□String□□□□□□□□□□□□□□□□Sheet1□□□□□□□□□□□□□□□□□3-2□□□

```
worksheet1 = workbook.add_worksheet□□            # Sheet1
worksheet2 = workbook.add_worksheet□'Foglio2'□   # Foglio2
worksheet3 = workbook.add_worksheet□'Data'□      # Data
worksheet4 = workbook.add_worksheet□□            # Sheet4
```



□3-2　□□□□□□

·add_format□[properties]□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□properties□dict□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□workbook.add_format□{'bold'□True}□□□□Format methods□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

```
bold = workbook.add_format□□

bold.set_bold□□
```

□□□□□□□□http://xlsxwriter.readthedocs.org/working_with_formats.html□

·add_chart□options□□□□□□□□□□□□□□□□□□□□□□□□□□insert_chart□□□□□□□□□□options□dict□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□chart=workbook.add_chart□{'type'□'line'}□□

·close□□□□□□□□□□□□□□□□□workbook.close□□□

2.Worksheet□

Worksheet□□□□□□Excel□□□□□XlsxWriter□□□□Excel□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

Worksheet□□□□□□□□□□□□□□□□□□Workbook□□□□add_worksheet□□□□□□□□Worksheet□□□□□□□□□□□Excel□□□□□□□□□□□□□□□□□□

·write□row□col□*args□□□□□□□□□□□□□□□□□□□□□□□row□□□□□col□□□□□□□□□□□□□0□*args□□□write□□□□□□□□□□□□□□□□□□□□□□□□□

·write_string□□□□□□□□□□□□□□

```
worksheet.write_string□0□ 0□ 'Your text here'□□
```

·write_number□□□□□□□□□□□□□

```
worksheet.write_number□'A2'□ 2.3451□□
```

·write_blank□□□□□□□□□□□□

```
worksheet.write□'A2'□ None□□
```

·write_formula□□□□□□□□□□□□□

```
worksheet.write_formula□2□ 0□ '=SUM□B1□B5□'□□
```

·write_datetime[illegible]

```
worksheet.write_datetime[illegible]7[illegible] 0[illegible]datetime.datetime.strptime
[illegible]'2013-01-23'[illegible] '%Y-%m-%d'[illegible]workbook.add_format
[illegible]{'num_format'[illegible] 'yyyy-mm-dd'}[illegible]
```

·write_boolean[illegible]

```
worksheet.write_boolean[illegible]0[illegible] 0[illegible] True[illegible]
```

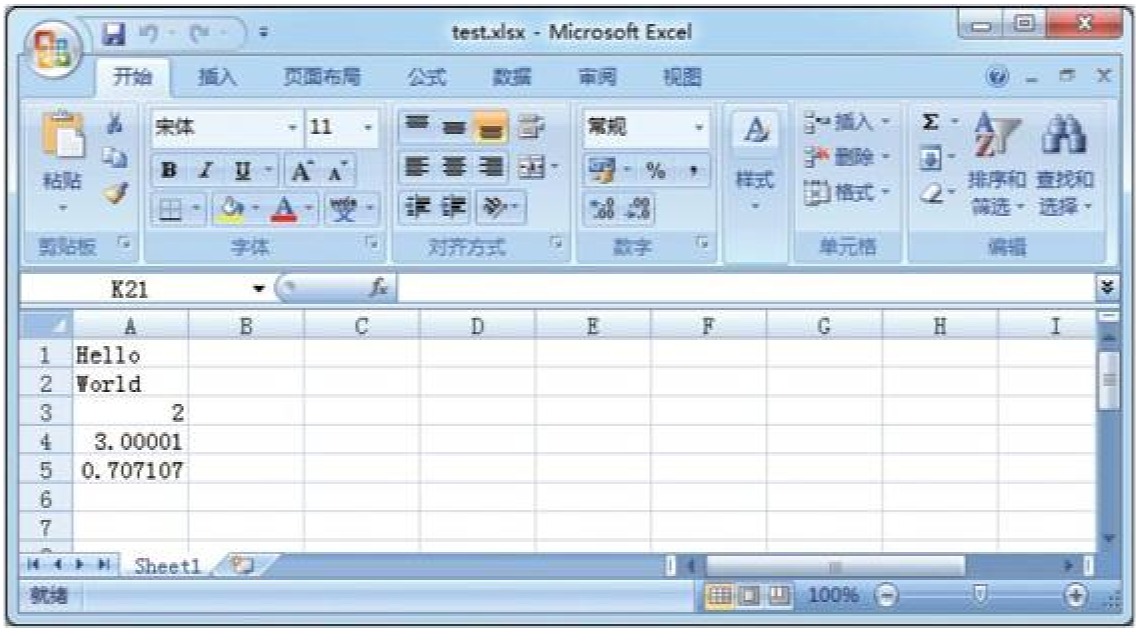
·write_url[illegible]

```
worksheet.write_url[illegible]'A1'[illegible] 'ftp[illegible]//www.python.org/'[illegible]
```

[illegible]write[illegible]

```
worksheet.write[illegible]0[illegible] 0[illegible] 'Hello'[illegible]          # write_string[illegible]

worksheet.write[illegible]1[illegible] 0[illegible] 'World'[illegible]          # write_string[illegible]

worksheet.write[illegible]2[illegible] 0[illegible] 2[illegible]                # write_number[illegible]

worksheet.write[illegible]3[illegible] 0[illegible] 3.00001[illegible]          # write_number[illegible]

worksheet.write[illegible]4[illegible] 0[illegible] '=SIN[illegible]PI[illegible]/4[illegible]'[illegible]   # write_formula[illegible]

worksheet.write[illegible]5[illegible] 0[illegible] ''[illegible]               # write_blank[illegible]

worksheet.write[illegible]6[illegible] 0[illegible] None[illegible]             # write_blank[illegible]
```

□□□□□□□□□□□3-3□□□□□□□



	A
1	Hello
2	World
3	2
4	3.00001
5	0.707107

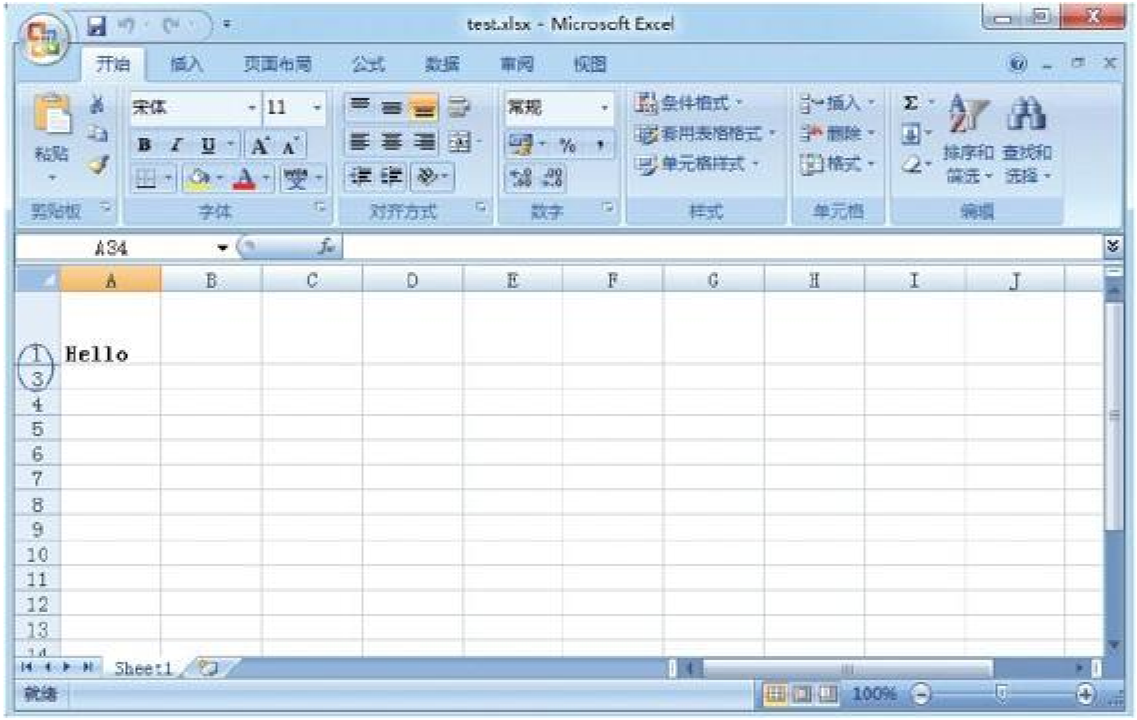
□3-3 □□□□□□□□□□□□□

·set_row□row□height□cell_format□options□□□□□□□□□□□□□□□□□□□row□int□□□□□□□□□□□□□□0□□□height□float□□□□□□□□□□□□□□□cell_format□format□□□□□□□□□□□□options□dict□□□□□□hidden□□□□□level□□□□□□□collapsed□□□□□□□□□□□□

```
worksheet.write□'A1'□ 'Hello'□     #□A1□□□□□'Hello'□□□

cell_format = workbook.add_format□{'bold'□ True}□    #□□□□□
□□□□□□

worksheet.set_row□0□ 40□ cell_format□    #□□□1□□□□□□□40□□□□
□□□□

                                          #□□□□
```

```
worksheet.set_row□1□ None□ None□ {'hidden'□ True}□    #□□□2
□□□□
```

□□□□□□□□□□□3-4□□□□□□□



□3-4 □□□□□□□□□□□

·set_column□first_col□last_col□width□cell_format□options□□□□□□□□□□□□□□□□□□first_col□int□□□□□□□□□□□□□□□□0□□□last_col□int□□□□□□□□□□□□□0□□□□□first_col□□□□width□float□□□□□□□□cell_format□Format□□□□□□□□□□options□dict□□□□□hidden□□□□□level□□□□□collapsed□□□□□□□□□□□

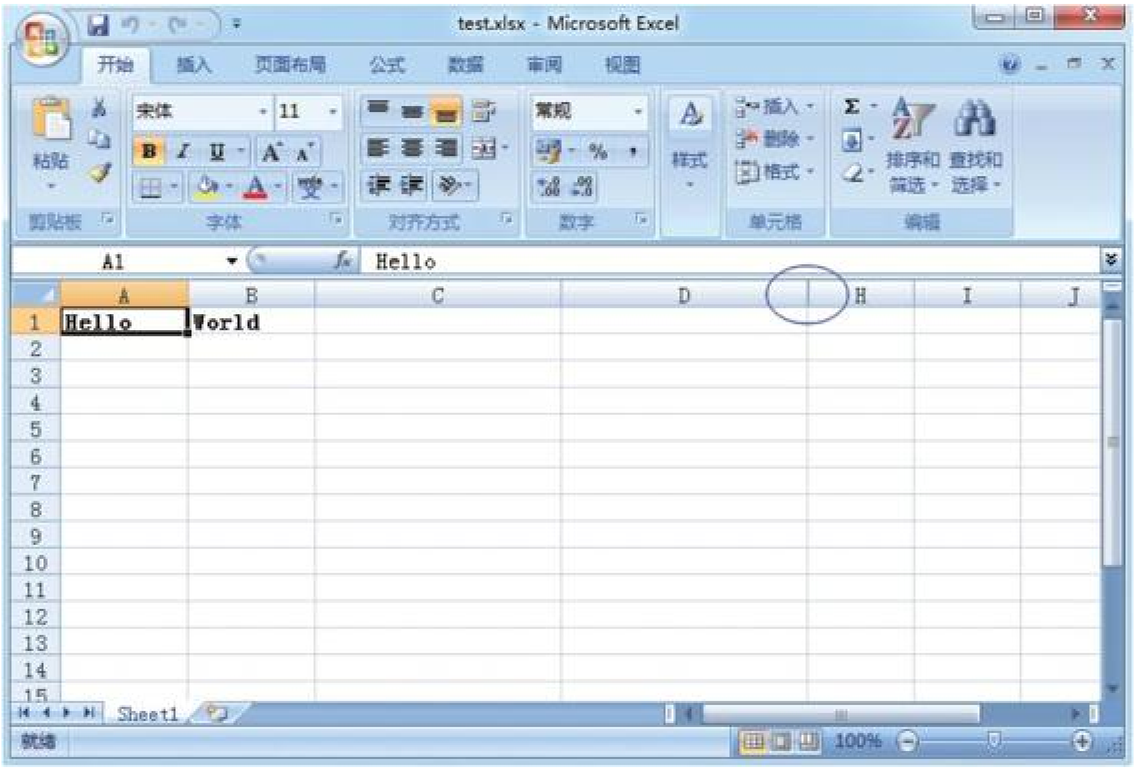
```
worksheet.write□'A1'□ 'Hello'□     #□A1□□□□□'Hello'□□□

worksheet.write□'B1'□ 'World'□     #□B1□□□□□'World'□□□

cell_format = workbook.add_format□{'bold'□ True}□    #□□□□
□□□□□

                                   #□□0□1□□A□B□ □□□□□□10□
□□

                                    □□□□□□□□

worksheet.set_column□0□1□ 10□cell_format□

worksheet.set_column□'C□D'□ 20□    #□□C□D□□□□□□20□□

worksheet.set_column□'E□G'□ None□ None□ {'hidden'□ 1}□    #
□□E□G□□□□
```

□□□□□□□□□□□3-5□□□□□□□

·insert_image□row□col□image[□options]□□□□□□□□□□□□□□□□□□□□PNG□JPEG□BMP□□□□□□□□row□□□□□col□□□□□□□□□□□□□0□□□image□string□□□□□□□□□□□options□dict□□□□□□□□□□□□□□□□□□□□□□□□URL□□□□□□□□□□□

```
#□B5□□□□□python-logo.png□□□□□□□□□□http□//python.org

worksheet.insert_image□'B5'□ 'img/python-logo.png'□ {'url'□
'http□//python.org'}□
```

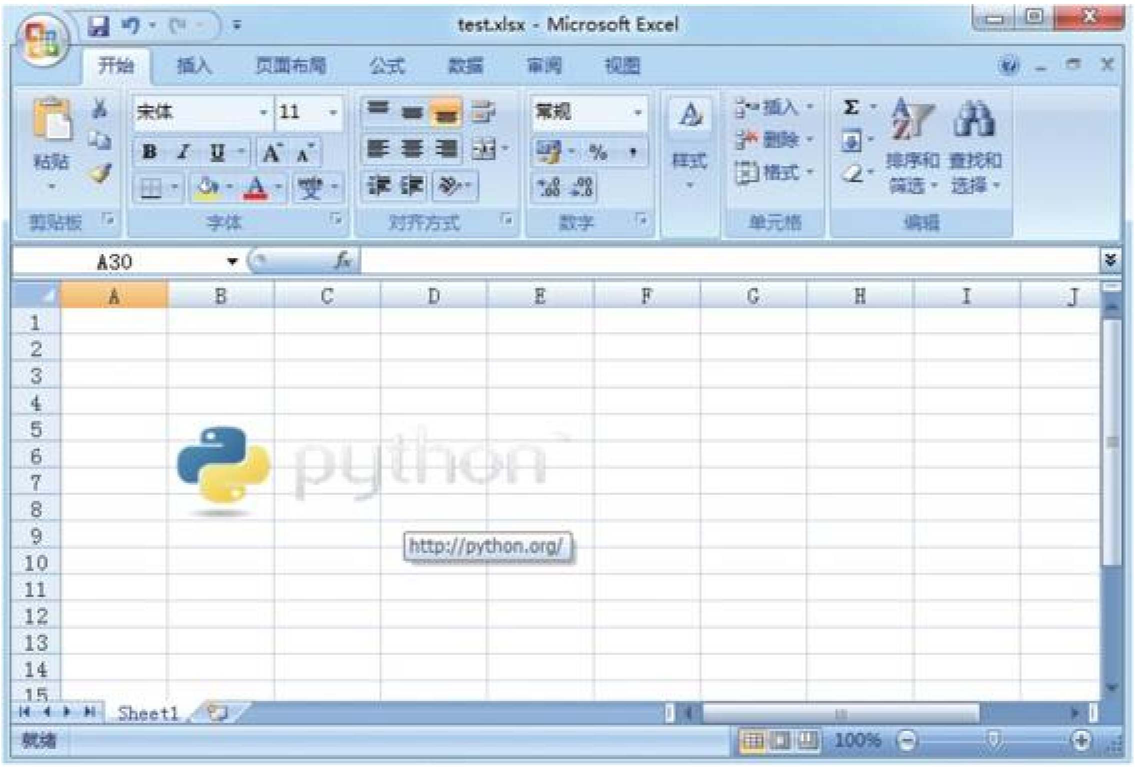
□□□□□□□□□□□3-6□□□□□□□



Hello

Hello World

[illegible]3-5 [illegible]



□3-6 □□□□□□□□□□□

3.Chart□

Chart□□□□XlsxWriter□□□Workbook□□□□□□add_chart□□□□□□□{type□'□□□□'}□□□□□□□□□□□□□□□□□

```
chart = workbook.add_chart□{type□ 'column'}□    #□□□□column
□□□□□□
```

□□□□□□□□□

·area□□□□□□□□□□□□□

·bar□□□□□□□□□□□□□

·column□□□□□□□□□□□□□

·line□□□□□□□□□□□□□

·pie□□□□□□□□□□□□□

·scatter□□□□□□□□□□□□□

·stock□□□□□□□□□□□□□

·radar□□□□□□□□□□□□□

□□□□□Worksheet□□□□□□insert_chart□□□□□□□□□□□□□□□□□

```
worksheet.insert_chart□'A7'□ chart□    #□A7□□□□□□
```

□□□□chart□□□□□□□□□

·chart.add_series□options□□□□□□□□□□□□□□□□□□□□□options□dict□□□□□□□□□□□□□□□□□□□□□□

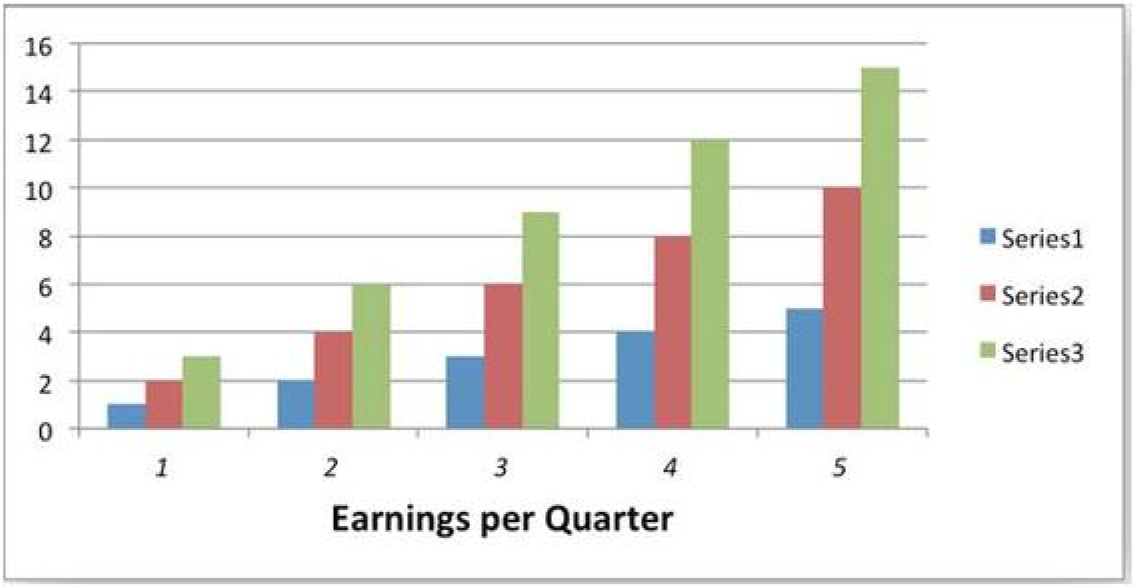
```
chart.add_series□{
    'categories'□ '=Sheet1□$A$1□$A$5'□
    'values'□     '=Sheet1□$B$1□$B$5'□
    'line'□       {'color'□ 'red'}□
}□
```

add_series□□□□□□□□□□□categories□values□line□□□categories□□□□□□□□□□□□□□values□□□□□□□□□□line□□□□□□□□□□□□□□□□□□□

·□□□□□□□□□□

·set_x_axis□options□□□□□□□□X□□□□□□□□□□□□□□□□3-7□□□

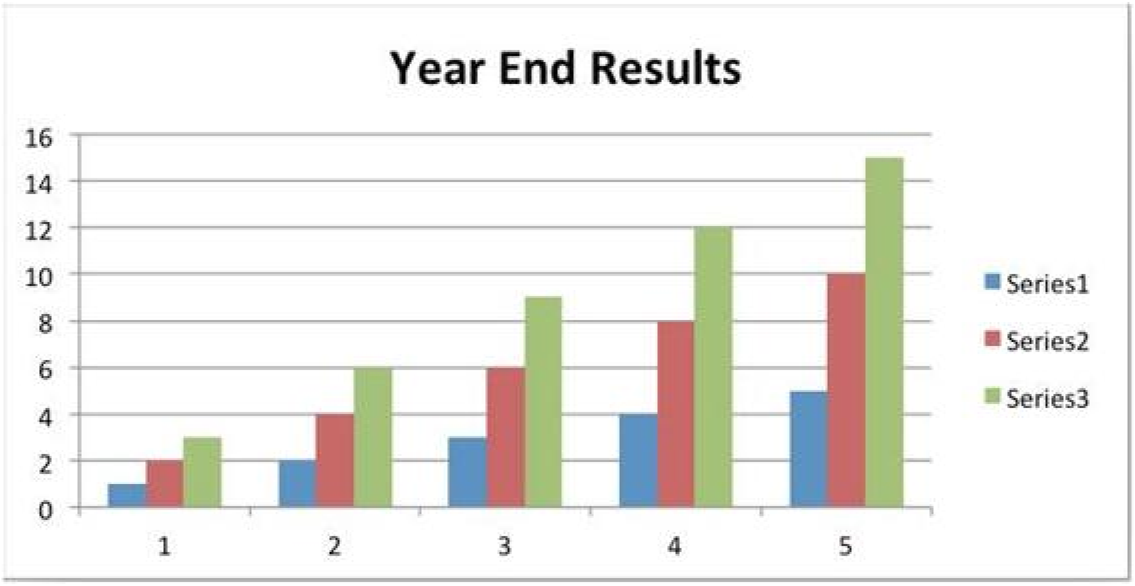
```
chart.set_x_axis□{

    'name'□ 'Earnings per Quarter'□    #□□X□□□□□

    'name_font'□ {'size'□ 14□ 'bold'□ True}□  #□□X□□□□□□□

    'num_font'□  {'italic'□ True }□    #□□X□□□□□□□

}□
```



□3-7 □□□□X□□□

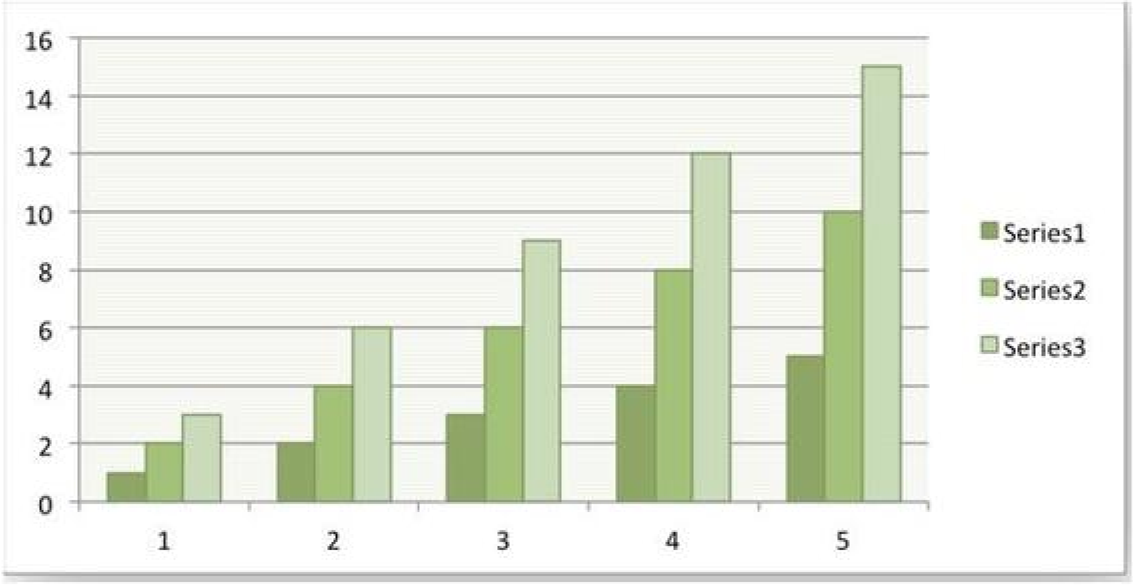
·set_size□options□□□□□□□□□□□□chart.set_size□{'width'□720□'height'□576}□□□□width□□□□height□□□□

·set_title□options□□□□□□□□□□□□chart.set_title□{'name'□'Year End Results'}□□□□□□□3-8□□□



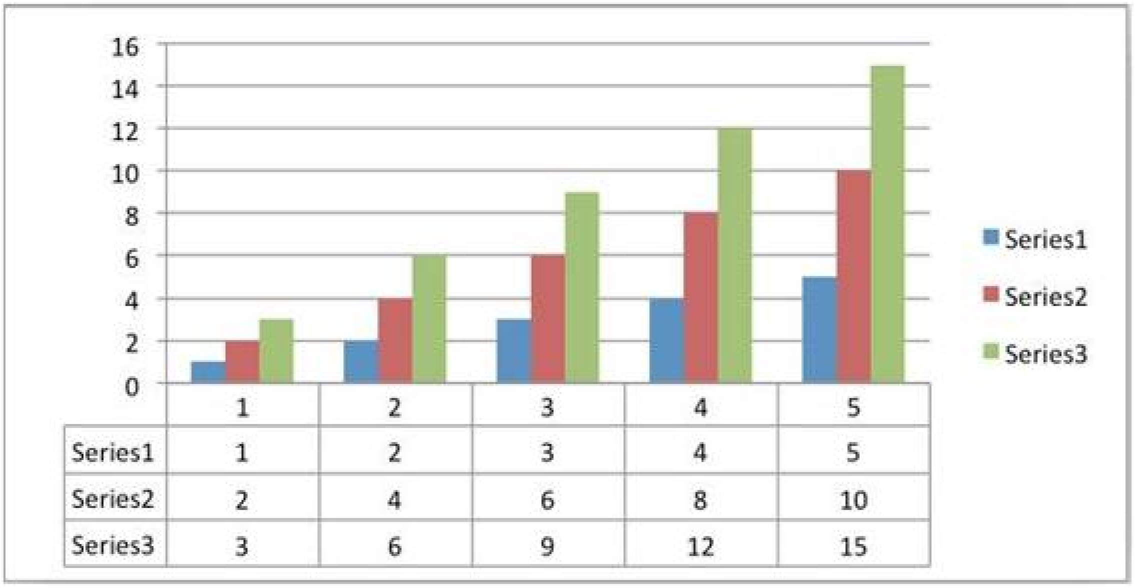
[illegible]3-8 [illegible]

·set_style[illegible]style_id[illegible]style_id[illegible]chart.set_style[illegible]37[illegible]3-9[illegible]



[illegible]3-9 [illegible]

·set_table□options□□□□□□X□□□□□□□□□□chart.set_table□□□□□□□□3-10□□□



□3-10　□□X□□□□□□□□

3.1.2　□□□□□□□□□□□□□□□□

□□□□□□□□□□5□□□□□□□□□□□□□XlsxWriter□□□□□□□□□Excel□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□workbook.add_chart□{'type'□'column'}□□□□□□□□□□□□□□□write_row□write_column□□□□□□□□□□□□□□□□□add_format□□□□□□□□□□□□□□□□□□□add_series□□□□□□□□□□□□□□□□□chart.set_size□set_title□set_y_axis□□□□□□□□□□□□□□□□□insert_chart□□□□□□□□□□□□□□□□

□□2.3□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ □□

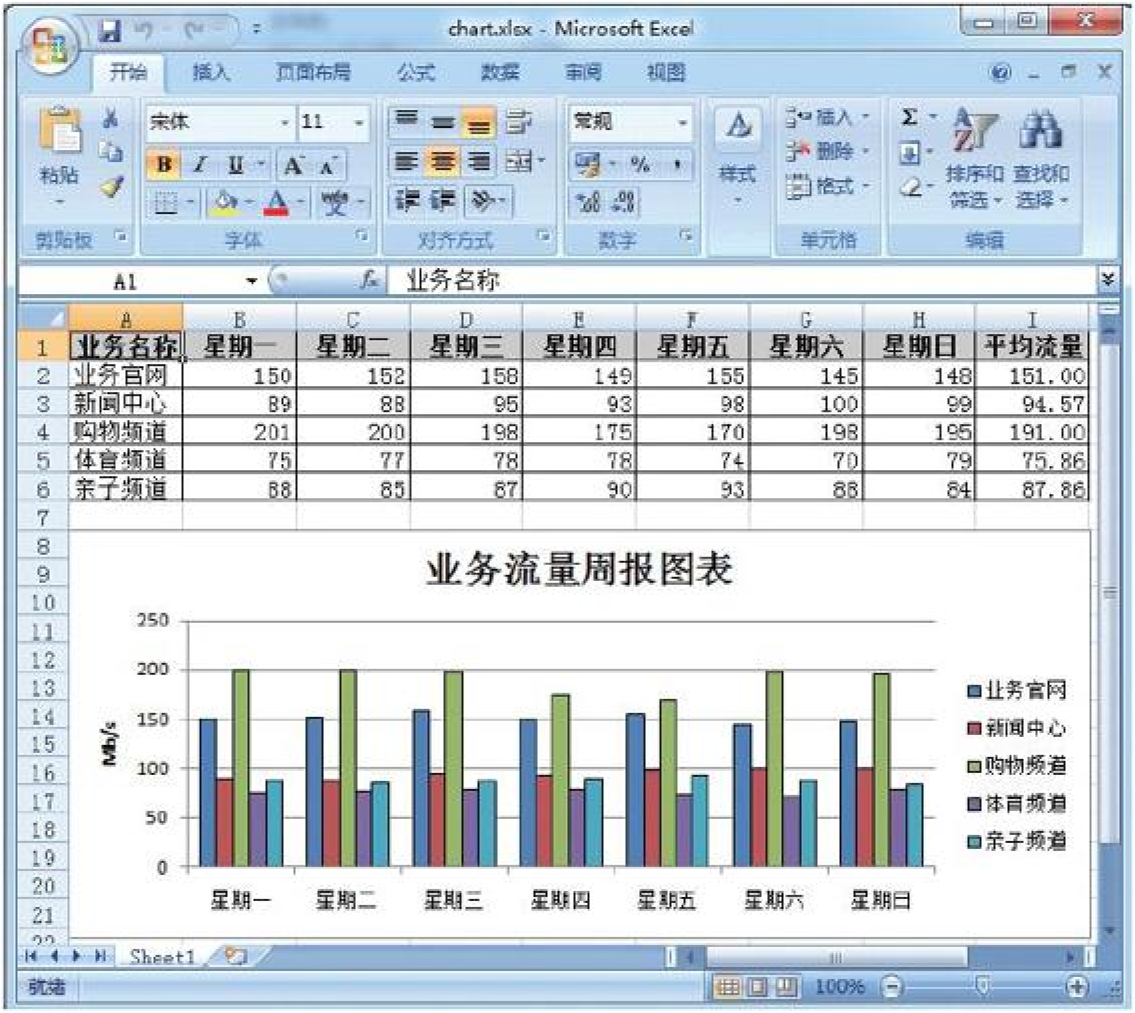
□/home/test/XlsxWriter/simple2.py□

```
#coding□ utf-8

import xlsxwriter

workbook = xlsxwriter.Workbook□'chart.xlsx'□    #□□□□Excel□
□

worksheet = workbook.add_worksheet□□    #□□□□□□□□□

chart = workbook.add_chart□{'type'□ 'column'}□    #□□□□□□□□

#□□□□□□□□

title = [u'□□□□'□u'□□□'□u'□□□'□u'□□□'□u'□□□'□u'□□□'□u'□□□'□
u'□□□'□u'□□□□']

buname= [u'□□□□'□u'□□□□'□u'□□□□'□u'□□□□'□u'□□□□']    #□□□□□
□

#□□5□□□□7□□□□□□□

data = [

    [150□152□158□149□155□145□148]□

    [89□88□95□93□98□100□99]□

    [201□200□198□175□170□198□195]□

    [75□77□78□78□74□70□79]□

    [88□85□87□90□93□88□84]□

]

format=workbook.add_format□□    #□□format□□□□
```

```
format.set_border□1□    #□□format□□□□□□□□□□1□□□□□□

format_title=workbook.add_format□□    #□□format_title□□□□

format_title.set_border□1□   #□□format_title□□□□□□□□□□1□□□□□□

format_title.set_bg_color□'#cccccc'□   #□□format_title□□□□□□□□□□

                                                   #'#cccccc'□□□

format_title.set_align□'center'□    #□□format_title□□□□□□□□□□□□

format_title.set_bold□□    #□□format_title□□□□□□□□□□□□

format_ave=workbook.add_format□□    #□□format_ave□□□□

format_ave.set_border□1□    #□□format_ave□□□□□□□□□□1□□□□□□

format_ave.set_num_format□'0.00'□   #□□format_ave□□□□□□□□□□□□□

#□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

worksheet.write_row□'A1'□title□format_title□

worksheet.write_column□'A2'□ buname□format□

worksheet.write_row□'B2'□ data[0]□format□

worksheet.write_row□'B3'□ data[1]□format□

worksheet.write_row□'B4'□ data[2]□format□

worksheet.write_row□'B5'□ data[3]□format□

worksheet.write_row□'B6'□ data[4]□format□

#□□□□□□□□□□

def chart_series□cur_row□□
```

```
    worksheet.write_formula□'I'+cur_row□ \

     '=AVERAGE□B'+cur_row+'□H'+cur_row+'□'□format_ave□    #
□□□AVERAGE□□□□

                                                               #
□□□□□□

    chart.add_series□{

        'categories'□ '=Sheet1□$B$1□$H$1'□    #□“□□□□□□□”□□
□□□□□□□X□□

        'values'□     '=Sheet1□$B$'+cur_row+'□
$H$'+cur_row□    #□□□□□□□□□


    #□□□□□

        'line'□       {'color'□ 'black'}□    #□□□□□□□black
□□□□

        'name'□ '=Sheet1□$A$'+cur_row□    #□□□□□□□□□□

    }□

for row in range□2□ 7□□    #□□□□□2~6□□□□□□□□□□□□□

    chart_series□str□row□□

#chart.set_table□□    #□□X□□□□□□□□□□□□

#chart.set_style□30□    #□□□□□□□□□□□□□

chart.set_size□{'width'□ 577□ 'height'□ 287}□    #□□□□□□

chart.set_title □{'name'□ u'□□□□□□□'}□    #□□□□□□□□□□

chart.set_y_axis□{'name'□ 'Mb/s'}□    #□□y□□□□□□□

worksheet.insert_chart□'A8'□ chart□    #□A8□□□□□□

workbook.close□□    #□□Excel□□
```

□□□□□□□□□□□3-11□□□□□□□



业务名称	星期一	星期二	星期三	星期四	星期五	星期六	星期日	平均流量
业务官网	150	152	158	149	155	145	148	151.00
新闻中心	89	88	95	93	98	100	99	94.57
购物频道	201	200	198	175	170	198	195	191.00
体育频道	75	77	78	78	74	70	79	75.86
亲子频道	88	85	87	90	93	88	84	87.86

□3-11　□□□□□□□□□□□

□□□□　3.4.1□XlsxWrite□□□□□□□□□□□□□□□http://xlsxwriter.readthedocs.org□

3.2 Python□rrdtool□□□□□

rrdtool□round robin database□□□□□□□□□□□□□□□round robin□□□□□□□□□□□□□□□□□□□□□rrdtool□□rrdtool□□□□□□□Cacti□Ganglia□Monitorix□□□□rrdtool□□□□□http://oss.oetiker.ch/rrdtool/□rrdtool□□□□□□□□□□□□□□□□□□□□□□□□Python□rrdtool□□□rrdtool□□□□□□□□□□□□□□create□fetch□graph□info□update□□□□□□□rrdtool□□□□□□□□□□□□□□□Python rrdtool□□□□□□□□□□□□□

rrdtool□□□□□□□□□□

```
easy_install python-rrdtool    #pip□□□□

pip install python-rrdtool    #easy_install□□□□

#□□rrdtool□□□□□□□□□□CentOS□□□□□□yum□□□□

# yum install rrdtool-python
```

3.2.1 rrdtool□□□□□□□□

□□□□rrdtool□□□□□□□□□□□□create□□□rrd□□update□□□rrd□□graph□□□□□fetch□□□rrd□□□

1.Create□□

create filename[--start|-b start time][--step|-s step][DS□ds-name□DST□heartbeat□min□max][RRA□CF□xff□steps□rows]□□□□□□□□□□rrd□rrdtool□□□□□□□□□□□

·filename□□□rrdtool□□□□□□□□□□□□.rrd□

·--start□□rrdtool□□□□□□□□□□□□□□timestamp□□□□

·--step□□rrdtool□□□□□□□□□□□□□□□□5□□□

·DS□□□□□□□□□□□□□□□□□□□□□

·DST□□□□□□□□□□rrdtool□□COUNTER□□□□□□□DERIVE□□□□□□□□□□□ABSOLUTE□□□□□□□□□□□□□0□□□□□□□□□GUAGE□□□□□□□□□RRA□□COMPUTE□□□□□□□□□□□DS□□□□□□□□□□5□□□□□□□□□□□□□□□□□□□COUNTER□

·RRA□□□□□□□□□□□□□□□□□□RRA□□□□□□□□□□□□□□□□□□□□□CF□□□□□□□□□□□□□□□□[RRA□CF□xff□steps□rows]□

·CF□□□□□□□□□AVERAGE□□□□□□MAX□□□□□□MIN□□□□□□LAST□□□□□4□□□□

2.update□□

update filename[--template|-t ds-name[□ds-name]...]N|timestamp□value[□value...][timestamp□value[□value...]...]□□□□□□□□□□rrdtool□□□□updatev□update□□□□□□□□□□□□□□□□□□□□□□□□□□□□□updatev□0□□□□□□□–1□□□□□□□□□□□□□

·filename□□□□□□□□□□rrd□□□□

·-t ds-name[□ds-name]□□□□□□□DS□□□

·N|Timestamp□□□□□□□□□□□N□□□□□□□□

·value[□value...]□□□□□□□□□DS□□□□□

3.graph□□

graph filename[-s|--start seconds][-e|--end seconds][-x|--x-grid x-axis grid and label][-y|--y-grid y-axis grid and label][--alt-y-grid][--alt-y-mrtg][--alt-autoscale][--alt-autoscale-max][--units-exponent]value[-v|--vertical-label text][-w|--width pixels][-h|--height pixels][-i|--interlaced][-f|--imginfo formatstring][-a|--imgformat GIF|PNG|GD][-B|--background value][-O|--

overlay value][-U|--unit value][-z|--lazy][-o|--logarithmic][-u|--upper-limit value][-l|--lower-limit value][-g|--no-legend][-r|--rigid][--step value][-b|--base value][-c|--color COLORTAG#rrggbb][-t|--title title][DEF□vname=rrd□ds-name□CF][CDEF□vname=rpn-expression][PRINT□vname□CF□format][GPRINT□vname□CF□format][COMMENT□text][HRULE□value#rrggbb[□legend]][VRULE□time#rrggbb[□legend]][LINE{1|2|3}□vname[#rrggbb[□legend]]][AREA□vname[#rrggbb[□legend]]][STACK□vname[#rrggbb[□legend]]]□□□□□□□□rrdtool□□□□□□□□□□□□□□□□□

·filename□□□□□□□□□□□□□□PNG□□□

·--start□□□□□□□

·--end□□□□□□□

·--x-grid□□X□□□□□□□□□□□□□

·--y-grid□□Y□□□□□□□□□□□□□

·--vertical-label□□Y□□□□□□□

·--width pixels□□□□□□□□□□□

·--height pixels[illegible]

·--imgformat[illegible]GIF|PNG|GD[illegible]

·--background[illegible]#rrggbb[illegible]

·--upper-limit[illegible]Y[illegible]

·--lower-limit[illegible]Y[illegible]

·--no-legend[illegible]

·--rigid[illegible]upper-limit[illegible]lower-limit[illegible]

·--title[illegible]

·DEF[illegible]vname=rrd[illegible]ds-name[illegible]CF[illegible]

·CDEF[illegible]vname=rpn-expression[illegible]

·GPRINT[illegible]vname[illegible]CF[illegible]format[illegible]

·COMMENT[illegible]text[illegible]

·HRULE[illegible]value#rrggbb[illegible]

·VRULE[illegible]time#rrggbb[illegible]

·LINE{1|2|3}[illegible]vname[illegible]{1|2|3}[illegible]

·AREA[illegible]vname[illegible]

4.fetch[illegible]

fetch filename CF[--resolution|-r resolution][--start|-s start][--end|-e end][illegible]rrdtool[illegible]

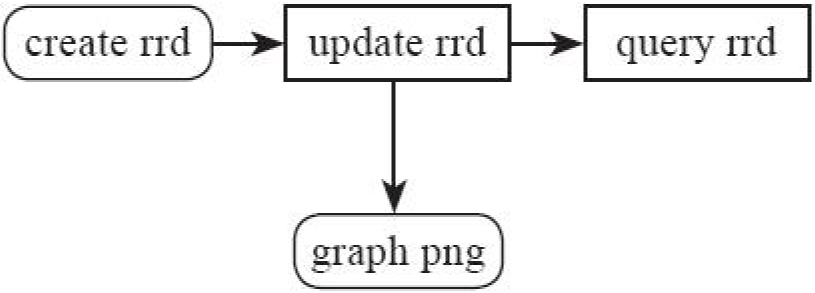
·filename[illegible]rrd[illegible]

·CF[illegible]AVERAGE[illegible]MAX[illegible]MIN[illegible]LAST[illegible]RRA[illegible]

·--start--end[illegible]

3.2.2 [illegible]

[illegible]CPU[illegible]rrdtool[illegible]create[illegible]rrd[illegible]update[illegible]graph[illegible]last[illegible]first[illegible]info[illegible]fetch[illegible]3-12[illegible]rrd[illegible]



□3-12   □□□□□rrd□□□□□□□

□□□   □□create□□□□rrd□□□□□□□□□□□rrd□□□□□□□step□□□□□--start□□□□DS□□□□□□DST□□□□□□□RRA□□□□□□□□□

□/home/test/rrdtool/create.py□

```
# -*- coding□ utf-8 -*-

#□/usr/bin/python

import rrdtool

import time

cur_time=str□int□time.time□□□□    #□□□□Linux□□□□□rrd□□□□

#□□□□□--step□300□□□5□□□□□□□□

rrd=rrdtool.create□'Flow.rrd'□'--step'□'300'□'--start'□
cur_time□

#□□□□□eth0_in□□□□□□eth0_out□□□□□□□□□□COUNTER□□□□□600□□□□□□

#□□□□600□□□□□□□□□□UNKNOWN□□□0□□□□□□□□□U□□□□□□□□

  'DS□eth0_in□COUNTER□600□0□U'□

  'DS□eth0_out□COUNTER□600□0□U'□
  #RRA□□□□□[RRA□CF□xff□steps□rows]□CF□□□AVERAGE□MAX□MIN□□□□
□□□□

  #xff□□□0.5□□□□□CDP□□PDP□□□□□□□□UNKNOWN□□□CDP□□□□□□UNKNOWN

  #□□□4□RRA□□□□□□□□□□□□□AVERAGE□□□□□□□□□□□□□□□□

  # □□5□□□1*300□□□□□□□□□□□□□600□□□2.08□

  # □□30□□□6*300□□□□□□□□□□□□□700□□□14.58□□2□□

  # □□2□□□24*300□□□□□□□□□□□□□775□□□64.58□□2□□□

  # □□24□□□288*300□□□□□□□□□□□□□797□□□797□□2□□

  'RRA□AVERAGE□0.5□1□600'□

  'RRA□AVERAGE□0.5□6□700'□

  'RRA□AVERAGE□0.5□24□775'□

  'RRA□AVERAGE□0.5□288□797'□

  'RRA□MAX□0.5□1□600'□

  'RRA□MAX□0.5□6□700'□

  'RRA□MAX□0.5□24□775'□

  'RRA□MAX□0.5□444□797'□

  'RRA□MIN□0.5□1□600'□

  'RRA□MIN□0.5□6□700'□

  'RRA□MIN□0.5□24□775'□

  'RRA□MIN□0.5□444□797'□

if rrd□

    print rrdtool.error□□
```

□□□　□□updatev□□□□rrd□□□□□□□□□□□□Linux□□□□□□□□eth0_in□eth0_out□□□□□□□□□□□□□□□□□□□□□psutil□□□□□□□psutil.net_io_counters□□[1]□□□□□□□psutil□□□□□□□1.1□□□□□□□□

□/home/test/rrdtool/update.py□

```
# -*- coding□ utf-8 -*-

#□/usr/bin/python

import rrdtool

import time□psutil

total_input_traffic = psutil.net_io_counters□□[1]    #□□□□□
□□

total_output_traffic = psutil.net_io_counters□□[0]    #□□□□
□□□

starttime=int□time.time□□□    #□□□□Linux□□□

#□□□□□□□□□□□updatev□□□□□□{'return_value'□ 0L}□□□□□□□□□□□□

update=rrdtool.updatev□'/home/test/rrdtool/Flow.rrd'□'%s□
%s□%s' % □str□starttime□□str□total_input_traffic□□str
□total_output_traffic□□□

print update
```

□□□□□crontab□□□□5□□□□□□□□□crontab□□□□□

```
*/5 * * * * /usr/bin/python /home/test/rrdtool/update.py > /dev/null 2>&1
```

□□□　□□graph□□□□□□□□□□□□□□□□□□--x-grid□□X□□□□□□DEF□□□□□□□□CDEF□□□□□HRULE□□□□□□□□□□□GPRINT□□□□□□□□□□□□□□□□□□□□□□

□/home/test/rrdtool/graph.py□

```
# -*- coding□ utf-8 -*-

#□/usr/bin/python

import rrdtool

import time

#□□□□□□□□□

title="Server network  traffic flow □"+time.strftime□'%Y-%m-%d'□ \

time.localtime□time.time□□□□+"□"

#□□□□"--x-grid"□"MINUTE□12□HOUR□1□HOUR□1□0□%H"□□□□□□□□□□□□□□□

“MINUTE□12”□□□□□□12□□□□□□□□□□

“HOUR□1”□□□□□□1□□□□□□□□□□

“HOUR□1”□□□□1□□□□□□□label□□

“0□%H”0□□□□□□□□□%H□□□□□□□□□

rrdtool.graph□ "Flow.png"□ "--start"□ "-1d"□"--vertical-label=Bytes/s"□\
"--x-grid"□"MINUTE□12□HOUR□1□HOUR□1□0□%H"□\

"--width"□"650"□"--height"□"230"□"--title"□title□

"DEF□inoctets=Flow.rrd□eth0_in□AVERAGE"□    #□□□□□□□□□□DS□CF

"DEF□outoctets=Flow.rrd□eth0_out□AVERAGE"□    #□□□□□□□□□□DS□CF

"CDEF□total=inoctets□outoctets□+"□    #□□CDEF□□□□□□□□□□□□□□total

"LINE1□total#FF8833□Total traffic"□    #□□□□□□□□□□

"AREA□inoctets#00FF00□In traffic"□    #□□□□□□□□□□

"LINE1□outoctets#0000FF□Out traffic"□    #□□□□□□□□□□

"HRULE□6144#FF0000□Alarm value\\r"□    #□□□□□□□□□□□□□□□6.1k

"CDEF□inbits=inoctets□8□*"□    #□□□□□□□bit□□*8□□□□□□inbits

"CDEF□outbits=outoctets□8□*"□    #□□□□□□□bit□□*8□□□□□□outbits

"COMMENT□\\r"□    #□□□□□□□□□□□□

"COMMENT□\\r"□

"GPRINT□inbits□AVERAGE□Avg In traffic\□ %6.2lf %Sbps"□    #□□□□□□□□

"COMMENT□   "□

"GPRINT□inbits□MAX□Max In traffic\□ %6.2lf %Sbps"□    #□□□□□□□□

"COMMENT□  "□

"GPRINT□inbits□MIN□MIN In traffic\□ %6.2lf %Sbps\\r"□    #□□□□□□□□

"COMMENT□ "□
```

```
"GPRINT□outbits□AVERAGE□Avg Out traffic\□ %6.2lf %Sbps"□
#□□□□□□□□

"COMMENT□ "□

"GPRINT□outbits□MAX□Max Out traffic\□ %6.2lf %Sbps"□    #□□
□□□□□□

"COMMENT□ "□

"GPRINT□outbits□MIN□MIN Out traffic\□ %6.2lf %Sbps\\r"□
#□□□□□□□□
```

□□□□□□□□□Flow.png□□□□□3-13□□□

□□

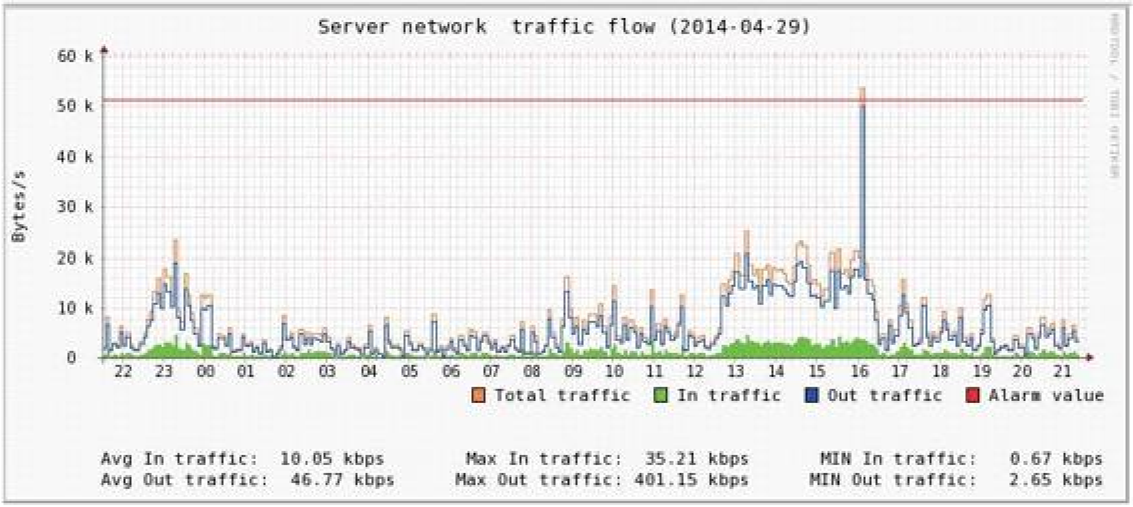
□□rrd□□□□□□□□□□□□□□□□□□□□□rrdtool□□□□□□□□□

·info□□rrd□□□□□□□□□rrdtool info Flow.rrd□

·first□□rrd□□□□□□□□□□□□□□rrdtool first Flow.rrd□

·last□□rrd□□□□□□□□□□□□□rrdtool last Flow.rrd□

·fetch□□□□□□□CF□□rrd□□□□rrdtool fetch Flow.rrd AVERAGE□



□3-13 graph.py□□□□□□

□□□□ 3.2.1rrdtool□□□□□□ http://bbs.chinaunix.net/thread-2150417-1-1.html□ http://oss.oetiker.ch/rrdtool/doc/index.en.html□

3.3 [illegible]

scapy [illegible]http://www.secdev.org/projects/scapy/[illegible]scapy[illegible]TCP[illegible]80[illegible]HTTP[illegible]443[illegible]HTTPS[illegible]IDC[illegible]

scapy[illegible]

```
# scapy[illegible]tcpdump[illegible]graphviz[illegible]ImageMagick[illegible]

# yum -y install tcpdump graphviz ImageMagick

# [illegible]

# wget http[illegible]//www.secdev.org/projects/scapy/files/scapy-
2.2.0.tar.gz

# tar -zxvf scapy-2.2.0.tar.gz

# cd scapy-2.2.0

# python setup.py install
```

3.3.1 [illegible]

scapy□□□□□□□□□□□□□□□□□□□□□□send□□□SYN\ACK□□□□□sniff□□□□□wrpcap□□□TCP□□□□traceroute□□□□□□□□□□□□□□□□□□□□□□□traceroute□□□□□□□□□□□□□

traceroute □target□dport=80□minttl=1□maxttl=30□sport=<RandShort>□l4=None□filter=None□timeout=2□verbose=None□**kargs□

□□□□□TCP□□□□□□□□□□□□□□□□

·target□□□□□□□□□□□□□□□IP□□□□□□□□□□□□□□□□□□□["www.qq.com"□"www.baidu.com"□"www.google.com.hk"]□

·dport□□□□□□□□□□□□□□□□□□□□□□□□[80□443]□

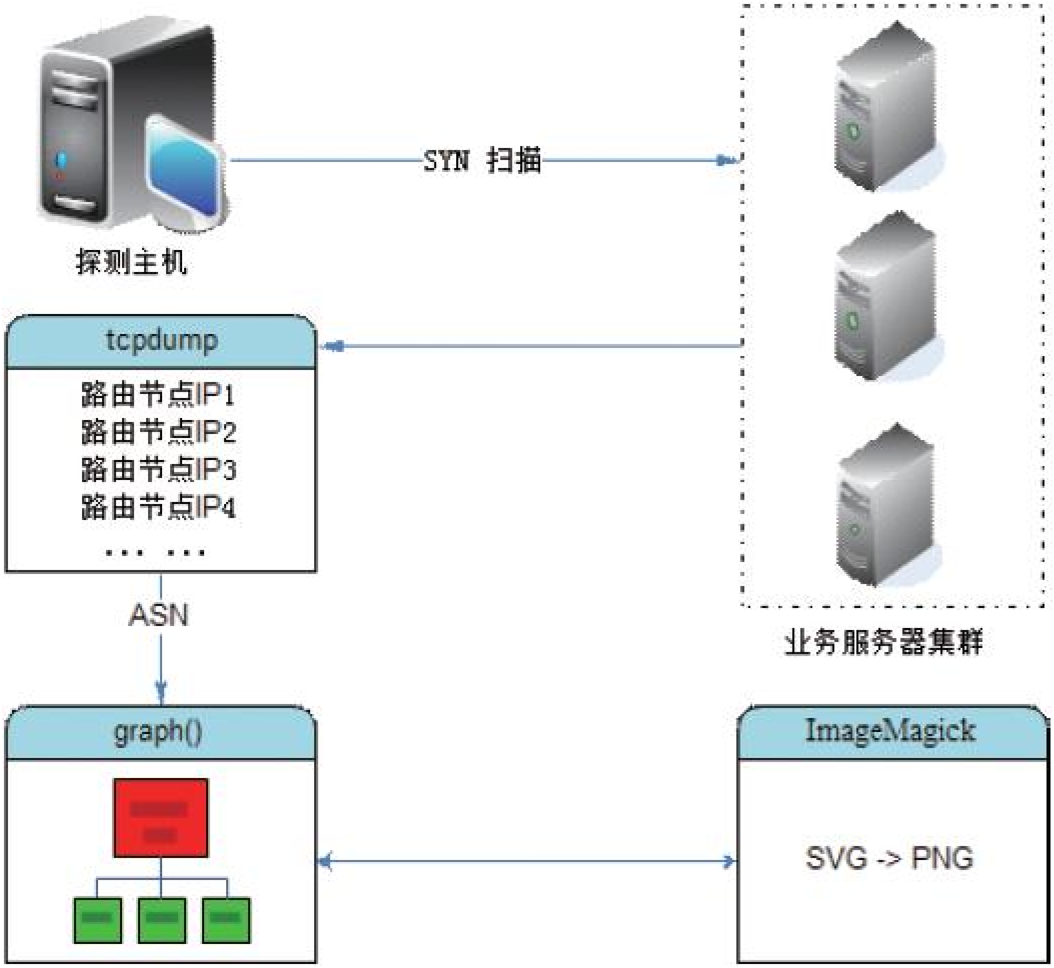
·minttl□□□□□□□□□□□□□□□□□□

·maxttl□□□□□□□□□□□□□□□□□□

3.3.2 □□□□□TCP□□□□□□□□□□

□□□□□□□□□scapy□traceroute□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□3-14□□□□□□□□□□□□SYN□□□□TCP□□□□□□□□□tcpdump□□□□□□□□□□□□□

□□□□□□□□□□graph□□□□□□□□IP□□□□□□□□□ASN□□□□IP□□□□□□□svg□□□□□□□□□ImageMagick□□□svg□□□□□png□□□□□□



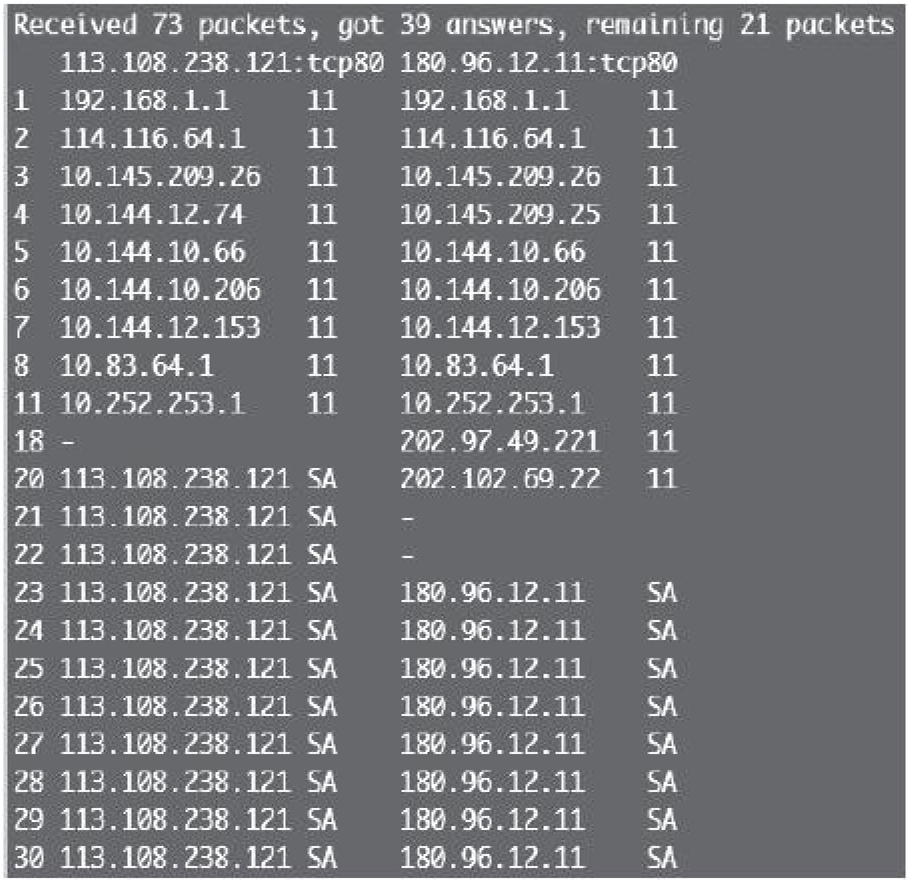
□3-14 TCP□□□□□□□□□□□□□

□□□□□□traceroute□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/home/test/scapy/simple1.py□

```
# -*- coding□ utf-8 -*-

import os□sys□time□subprocess

import warnings□logging

warnings.filterwarnings□"ignore"□
category=DeprecationWarning□ #□□scapy□□□□□

logging.getLogger□"scapy.runtime"□.setLevel□logging.ERROR□
#□□□□IPv6□□□□

from scapy.all import traceroute

domains = raw_input□'Please input one or more IP/domain□ '□
#□□□□□□□□IP

target =  domains.split□' '□

dport = [80]    #□□□□□□□

if len□target□ >= 1 and target[0]□=''□

    res□unans = traceroute□target□dport=dport□retry=-2□ #□□
□□□□

    res.graph□target="> test.svg"□    #□□svg□□□□

    time.sleep□1□

    subprocess.Popen□"/usr/bin/convert test.svg test.png"□
shell=True□ #svg□png□□

else□

    print "IP/domain number of errors□exit"
```

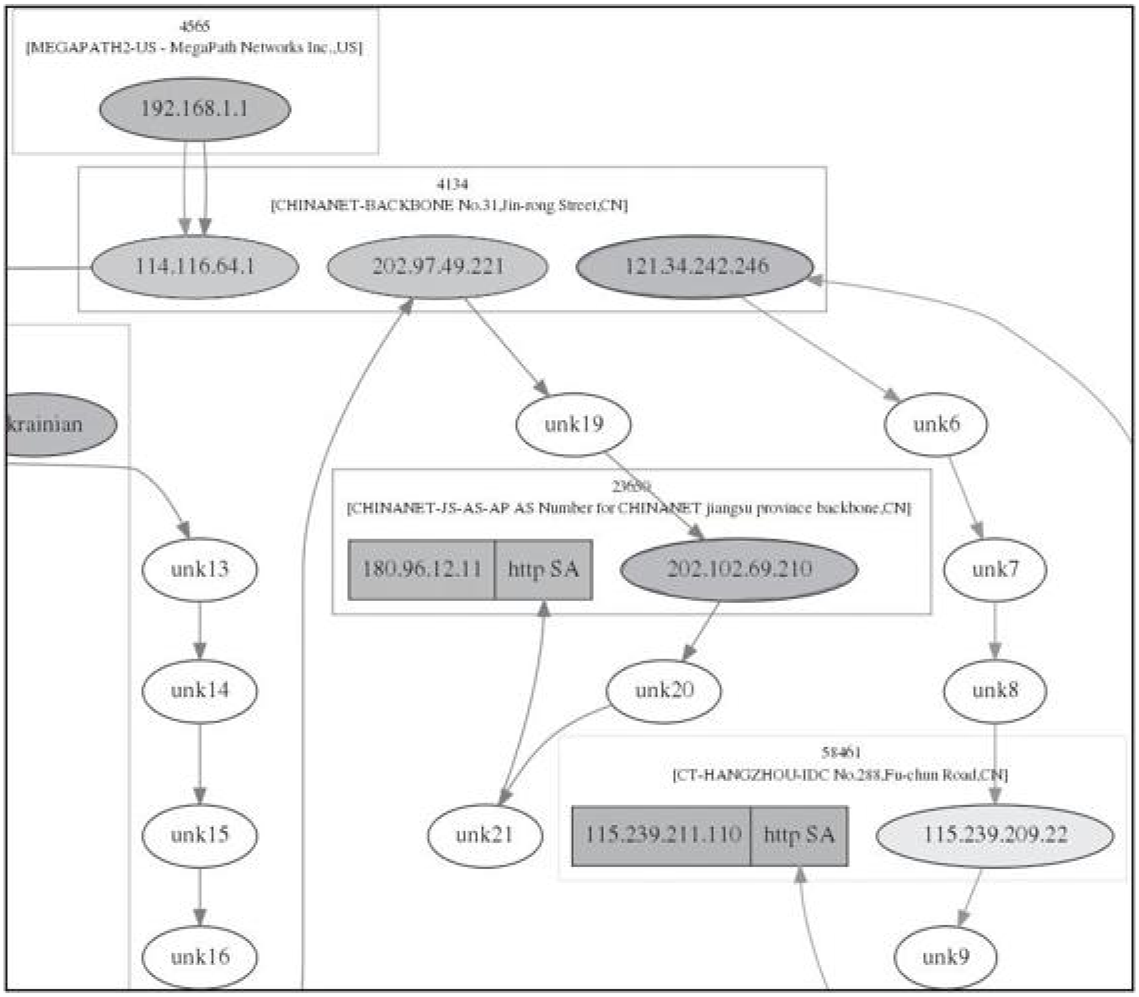
□□□□□□□□3-15□“-”□□□□□□□□□□□□□“11”□□□□□□□□□□□□“SA”□□□□□□□□□□□□□□□□□□□□□□IP□



```
Received 73 packets, got 39 answers, remaining 21 packets
   113.108.238.121:tcp80 180.96.12.11:tcp80
1  192.168.1.1     11    192.168.1.1     11
2  114.116.64.1    11    114.116.64.1    11
3  10.145.209.26   11    10.145.209.26   11
4  10.144.12.74    11    10.145.209.25   11
5  10.144.10.66    11    10.144.10.66    11
6  10.144.10.206   11    10.144.10.206   11
7  10.144.12.153   11    10.144.12.153   11
8  10.83.64.1      11    10.83.64.1      11
11 10.252.253.1    11    10.252.253.1    11
18 -                     202.97.49.221   11
20 113.108.238.121 SA    202.102.69.22   11
21 113.108.238.121 SA    -
22 113.108.238.121 SA    -
23 113.108.238.121 SA    180.96.12.11    SA
24 113.108.238.121 SA    180.96.12.11    SA
25 113.108.238.121 SA    180.96.12.11    SA
26 113.108.238.121 SA    180.96.12.11    SA
27 113.108.238.121 SA    180.96.12.11    SA
28 113.108.238.121 SA    180.96.12.11    SA
29 113.108.238.121 SA    180.96.12.11    SA
30 113.108.238.121 SA    180.96.12.11    SA
```

□3-15　□□□□□□

□□□□□□□□□□3-16□□□□□□“-”□□□unk*□□□□□□□□□□□□□□ASN□□□□□□□□□IDC□□□□IP“202.102.69.210”□“CHINANET-JS-AS-AP AS Number for CHINANET jiangsu province backbone□CN”□□□□IP□□□□□□□□□□□□□


4565
[MEGAPATH2-US - MegaPath Networks Inc.,US]
192.168.1.1
4134
[CHINANET-BACKBONE No.31,Jin-rong Street,CN]
114.116.64.1
202.97.49.221
121.34.242.246
krainian
unk19
unk6
23650
[CHINANET-JS-AS-AP AS Number for CHINANET jiangsu province backbone,CN]
180.96.12.11
http SA
202.102.69.210
unk13
unk7
unk14
unk20
unk8
58461
[CT-HANGZHOU-IDC No.288,Fu-chun Road,CN]
unk15
unk21
115.239.211.110
http SA
115.239.209.22
unk16
unk9

□3-16 □□□□□

□□IE8□□□chrome□□□□□□□SVG□□□□□□□□□□□□□□□□□png□□□□□□□□□□□□□□□□□□□□□□□

[illegible] 3.3.1[illegible]scapy[illegible] http://www.secdev.org/projects/scapy/doc/usage.html[illegible]

[illegible]4[illegible] Python[illegible]

[illegible]ITIL[illegible]Python[illegible]

4.1 □□□□□□□□□□□□

Clam AntiVirus□ClamAV□□□□□□□□□□□□□□□□ □□□□□□□□□□□□□□□□□□□□□□□□□□ http://www.clamav.net/lang/en/□□□ClamAV □□□Linux□Unix□□□□□□□□□□□□□□□pyClamad □http://xael.org/norman/python/pyclamd/□ □□□Python□□□□□□□□Python□□□□ClamAV□□ □□□□□□clamd□□□□□□□□□□□□□□□□□□□ pyClamad□□□□□□□□□□□□□□□□□□□□□□□□□□□ □□

pyClamad□□□□□□□□□□

```
# 1□□□□□□□□□□□□□□□

# yum install -y clamav clamd clamav-update    #□□clamavp□□
□□□

# chkconfig --levels 235 clamd on    #□□□□□□□□clamd□□□□

# /usr/bin/freshclam    #□□□□□□□□□□□crontab□□□□□

# setenforce 0    #□□SELinux□□□□□□□□□□□□□□□□

# □□□□□□□□IP□□□□□□□□□□□□□□□□□□IP□“0.0.0.0”□□□□□□□IP

# sed -i -e '/^TCPAddr/{ s/127.0.0.1/0.0.0.0/□ }'
/etc/clamd.conf

# /etc/init.d/clamd start    #□□□□□□□□

# 2□□□□□□pyClamad□□□□
# wget http□//xael.org/norman/python/pyclamd/pyClamd-
0.3.4.tar.gz

# tar -zxvf pyClamd-0.3.4.tar.gz

# cd pyClamd-0.3.4

# python setup.py install
```

4.1.1 □□□□□□□□

pyClamad□□□□□□□□□□□□ClamdNetworkSocket□□□□□□□□□□□□□□□clamd□□□□□ClamdUnixSocket□□□□□□□□Unix□□□□□□clamd□□□□□□□□□□□□□□□□□ClamdNetworkSocket□□□□□□□□

·__init__□self□host='127.0.0.1'□port=3310□timeout=None□□□□□ClamdNetworkSocket□□□□□□□□□□host□□□□□IP□□□port□□□□□□□□□□3310□□/etc/clamd.conf□□□□□□TCPSocket□□□□□□□□timeout□□□□□□□□□

·contscan_file□self□file□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□file□string□□□□□□□□□□□□□□□□□□

·multiscan_file□self□file□□□file [illegible]string[illegible]

·scan_file[illegible]self[illegible]file[illegible]file[illegible]string[illegible]

·shutdown[illegible]self[illegible]clamd[illegible]

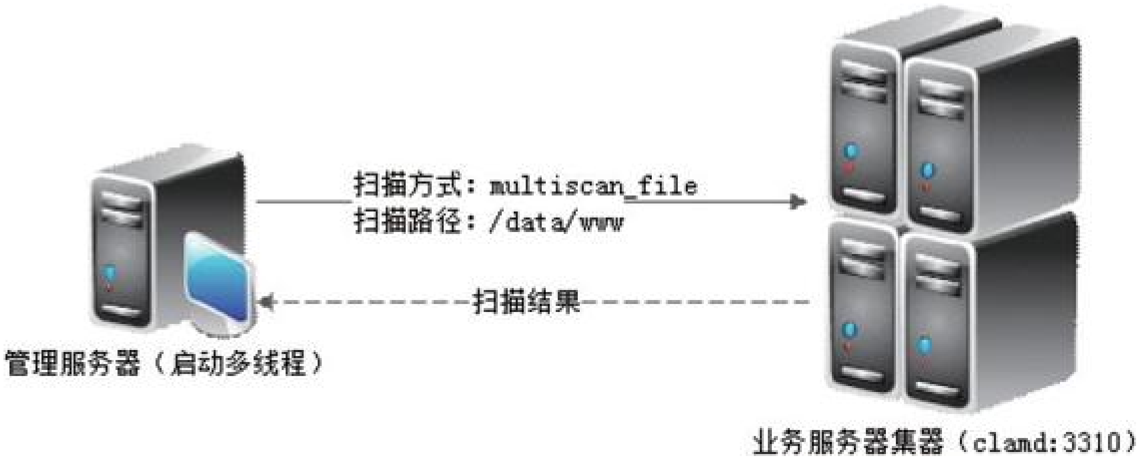
·stats[illegible]self[illegible]Clamscan[illegible]

·reload[illegible]self[illegible]clamd[illegible]reload[illegible]

·EICAR[illegible]self[illegible]EICAR[illegible]

4.1.2 [illegible]

[illegible]4-1[illegible]clamd[illegible]3310[illegible]clamd[illegible]



□4-1   □□□□□□□□□

□□□□□□ClamdNetworkSocket□□□□□□□□□□□□□□□□socket□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/home/test/pyClamad/simple1.py□

```
#□/usr/bin/env python

# -*- coding□ utf-8 -*-

import time

import pyclamd

from threading import Thread

class Scan□Thread□□

    def __init__ □self□IP□scan_type□file□□

        """□□□□□□□□□□"""

        Thread.__init__□self□

        self.IP = IP
        self.scan_type=scan_type

        self.file = file

        self.connstr=""

        self.scanresult=""

    def run□self□□

        """□□□run□□"""

        try□

            cd = pyclamd.ClamdNetworkSocket□self.IP□
3310□    #□□□□□□□□□□□

            if cd.ping□□□    #□□□□□

                self.connstr=self.IP+" connection [OK]"

                cd.reload□□    #□□clamd□□□□□□□□□□□□□□□
reload□□□□

                if self.scan_type=="contscan_file"□    #□□□
□□□□□□

                    self.scanresult="{0}\n".format
□cd.contscan_file□self.file□□

                elif self.scan_type=="multiscan_file"□

                    self.scanresult="{0}\n".format
□cd.multiscan_file□self.file□□

                elif self.scan_type=="scan_file"□

                    self.scanresult="{0}\n".format
□cd.scan_file□self.file□□

                time.sleep□1□    #□□□□1□

            else□
```

```
                self.connstr=self.IP+" ping error□exit"
                return
        except Exception□e□
            self.connstr=self.IP+" "+str□e□
IPs=['192.168.1.21'□'192.168.1.22']    #□□□□□□
scantype="multiscan_file"    #□□□□□□□□□multiscan_file□
contscan_file□scan_file
scanfile="/data/www"    #□□□□□□
i=1
threadnum=2    #□□□□□□□□
scanlist = []    #□□□□Scan□□□□□□□
for ip in IPs□
    currp = Scan□ip□scantype□scanfile□    #□□□□Scan□□□□□□
□IP□□□□□□□□□□□
    scanlist.append□currp□    #□□□□□□□
    if i%threadnum==0 or i==len□IPs□□    #□□□□□□□□□□IP□□□□□
□□□□□□
        for task in scanlist□
            task.start□□    #□□□□
        for task in scanlist□
            task.join□□    #□□□□□□□□□□□□□□□□□
            print task.connstr    #□□□□□□□□□
            print task.scanresult    #□□□□□□
        scanlist = []
    i+=1
```

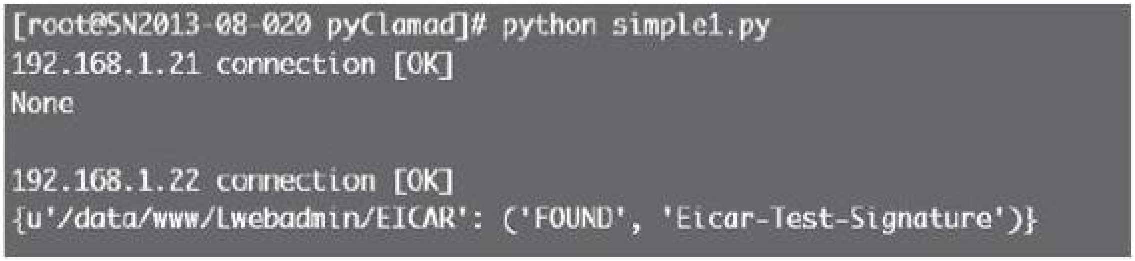
□□EICAR□□□□□□□□□□□□□□□□□/tmp/EICAR□□□□□□

```
void = open（'/tmp/EICAR'，'w'）.write（cd.EICAR（））
```

□□□□□□□□□□□□□□□□□□□□□/tmp/EICAR□□□□□□□□□□□□□□□□□□□□

```
#cat /tmp/EICAR

u'X5O！P%@AP[4\\PZX54（P^）7CC）7}$EICAR-STANDARD-ANTIVIRUS-
TEST-FILE！$H+H*'
```

□□4-2□□□192.168.1.21□□□□□□□□□192.168.1.22□□□□□□□□□□□EICAR□



```
[root@SN2013-08-020 pyClamad]# python simple1.py
192.168.1.21 connection [OK]
None

192.168.1.22 connection [OK]
{u'/data/www/Lwebadmin/EICAR': ('FOUND', 'Eicar-Test-Signature')}
```

□4-2　□□□□□□□□□□□□□

□□□□ 4.1.1□pyClamad□□□□□□□□http://xael.org/norman/python/pyclamd/pyclamd.html□

4.2 [illegible]

[illegible]22[illegible]21[illegible]3389[illegible]3306[illegible]Python[illegible]python-nmap[illegible]python-nmap[illegible]nmap[illegible]Python[illegible]Python[illegible]nmap[illegible]

python-nmap[illegible]

```
# yum -y install nmap    #[illegible]nmap[illegible]

# [illegible]

# wget http[illegible]//xael.org/norman/python/python-nmap/python-
nmap-0.1.4.tar.gz

# tar -zxvf python-nmap-0.1.4.tar.gz

# cd python-nmap-0.1.4

# python setup.py install
```

4.2.1 [illegible]

□□□□python-nmap□□□□□□□□□□□□PortScanner□□□□□□□□nmap□□□□□□□□□□□□□□□□PortScannerHostDict□□□□□□□□□□□□□□□□□□□□□□□PortScanner□□□□□□□□□□□

·scan□self□hosts='127.0.0.1'□ports=None□arguments='-sV'□□□□□□□□□□□□□□nmap□□□□□□□□□□□hosts□□□□□□□□□□□□□□□□□□□□□“scanme.nmap.org”□“198.116.0-255.1-127”□“216.163.128.20/20”□□□□□ports□□□□□□□□□□□□□□□□□□“22□53□110□143-4564”□□□□□□arguments□□□□□□□□□nmap□□□□□□□□□“-sU-sX-sC”□□□□

```
nm = nmap.PortScanner□□

nm.scan□'192.168.1.21-22'□'22□80'□
```

·command_line□self□□□□□□□□□□□□□nmap□□□□□

```
>>> nm.command_line□□

u'nmap -oX - -p 22□80 -sV 192.168.1.21-22'
```

·scaninfo□self□□□□□□nmap□□□□□□□□□□□□□□□

```
>>> nm.scaninfo□□
{u'tcp'□ {'services'□ u'22□80'□ 'method'□ u'syn'}}
```

·all_hosts□self□□□□□□nmap□□□□□□□□□□□□□□□□□□

```
[u'192.168.1.21'□ u'192.168.1.22']
```

□□□□PortScannerHostDict□□□□□□□□□□□

·hostname□self□□□□□□□□□□□□□□□□□

```
>>> nm['192.168.1.22'].hostname□□
u'SN2013-08-022'
```

·state□self□□□□□□□□□□□□□□□□4□□□□up□down□unknown□skipped□□□□

```
>>> nm['192.168.1.22'].state□□
u'up'
```

·all_protocols□self□□□□□□□□□□□□□□

```
>>> nm['192.168.1.22'].all_protocols□□
[u'tcp']
```

·all_tcp□□□self□□□□□□TCP□□□□□□□□□□

```
>>> nm['192.168.1.22'].all_tcp□□
[22□ 80]
```

·tcp□self□port□□□□□□□□TCP□□port□□□□□□□□□□

```
>>> nm['192.168.1.22'].tcp□22□
{'state'□ u'open'□ 'reason'□ u'syn-ack'□ 'name'□ u'ssh'}
```

4.2.2 □□□□□□□□□□□□

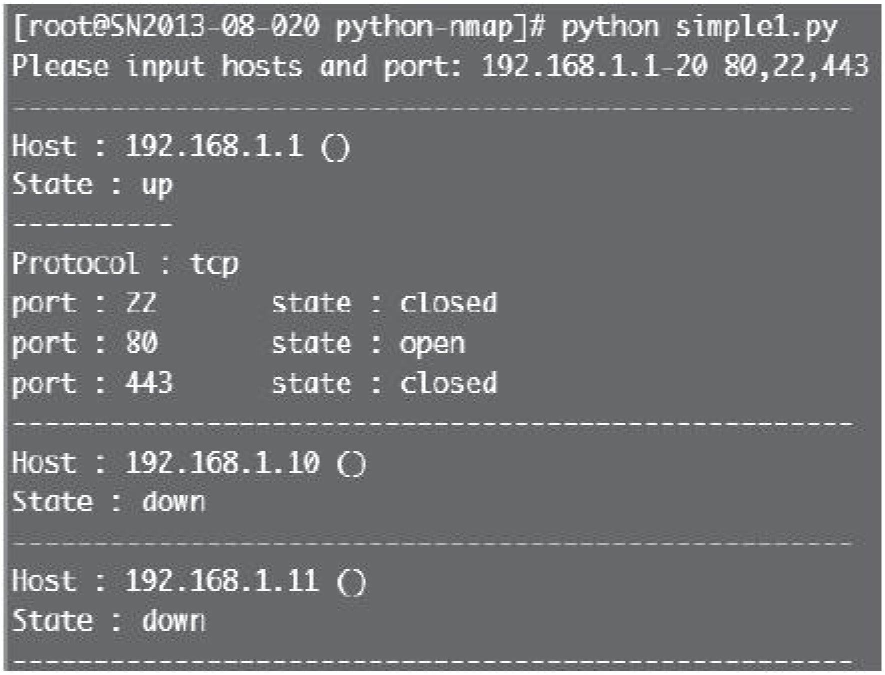
□□□□□□python-nmap□□□□□□□□□□□□□□□□□□□crontab□□□192.168.1.20-25□□Web□□□□80□□□□open□□□□□□□□□scan□□□□□arguments□□□□□“-v-PE-p'+□□”□-v□□□□□□□□□□□□□□up□□□□□□□-PE□□□□TCP□□□□□TCP SYN□□□□-p□□□□□□□□□□□□□□□□□□□□for□□

□/home/test/python-nmap/simple1.py□

```
#□/usr/bin/env python

# -*- coding□ utf-8 -*-

import sys

import nmap

scan_row=[]

input_data = raw_input□'Please input hosts and port□ '□

scan_row = input_data.split□" "□

if len□scan_row□□=2□

    print "Input errors□example \"192.168.1.0/24 80□443□22\""

    sys.exit□0□

hosts=scan_row[0]    #□□□□□□□□□

port=scan_row[1]    #□□□□□□□□□

try□

    nm = nmap.PortScanner□□    #□□□□□□□□

except nmap.PortScannerError□

    print□'Nmap not found'□ sys.exc_info□□[0]□

    sys.exit□0□

except□

    print□"Unexpected error□"□ sys.exc_info□□[0]□

    sys.exit□0□
```

```
try□

    #□□□□□□□□□□□□□□□hosts□nmap□□□□□□□arguments

    nm.scan□hosts=hosts□ arguments=' -v -sS -p '+port□

except Exception□e□

    print "Scan erro□"+str□e□

for host in nm.all_hosts□□□    #□□□□□□

    print□'----------------------------------------------------'□

    print□'Host □ %s □%s□' % □host□ nm[host].hostname□□□□    #□□□□□□□□

    print□'State □ %s' % nm[host].state□□□    #□□□□□□□□up□down

    for proto in nm[host].all_protocols□□□    #□□□□□□□□tcp□udp

        print□'----------'□

        print□'Protocol □ %s' % proto□    #□□□□□

        lport = nm[host][proto].keys□□    #□□□□□□□□□□□

        lport.sort□□    #□□□□□□

        for port in lport□    #□□□□□□□□□□□□

            print□'port □ %s\tstate □ %s' % □port□ nm[host][proto][port]['state']□□
```

□□□□□□□□□□□□□□□□www.qq.com□192.168.1.*□192.168.1.1-20□192.168.1.0/24□□□□□□□□□□□□□□□80□443□22□80□22-443□□□□□□□□□4-3□□□



```
[root@SN2013-08-020 python-nmap]# python simple1.py
Please input hosts and port: 192.168.1.1-20 80,22,443
----------------------------------------------------
Host : 192.168.1.1 ()
State : up
----------
Protocol : tcp
port : 22       state : closed
port : 80       state : open
port : 443      state : closed
----------------------------------------------------
Host : 192.168.1.10 ()
State : down
----------------------------------------------------
Host : 192.168.1.11 ()
State : down
----------------------------------------------------
```

□4-3　□□IP□□□□□□□□□

□□□□　4.2.1□Python-nmap□□□□□□□□□□□ http://xael.org/norman/python/python-nmap/□□□□□□□□□□□□□□example.py□

□□□□　□□□

·□5□　□□□□□□□□□pexpect□□

·□6□　□□□□□□□□□paramiko□□

·□7□　□□□□□□□□□Fabric□□

·□8□　□“□”□□□□□□□WebServer

·□9□　□□□□□□□Ansible□□

·□10□　□□□□□□□Saltstack□□

·□11□　□□□□□□□Func□□

·□12□　Python□□□□□□□

[illegible]5[illegible] [illegible]pexpect[illegible]

pexpect[illegible]Linux[illegible]expect[illegible]Python[illegible] pexpect[illegible]ssh[illegible]ftp[illegible]passwd[illegible]telnet[illegible] [illegible] FTP[illegible] [illegible]pexpect[illegible] http://pexpect.readthedocs.org/en/latest/[illegible] [illegible]3.0[illegible]

5.1 pexpect□□□

pexpect□□Python□□□□□□□□□□pip□easy_install□□□□□□□□□□□□□□□□□□□□□□□□□□□□pip□easy_install□□

```
pip install pexpect

easy_install pexpect
```

□□□□□□□□□□□□GitHub□□□□□□□□□□□□□□□□

```
#wget
https□//github.com/pexpect/pexpect/releases/download/3.0/pexpect-3.0.tar.gz -O pexpect-3.0.tar.gz

#tar –zxvf pexpect-3.0.tar.gz

#cd pexpect-3.0

#python setup.py install
```

□□□□□□□□□□□□□□□□□□□□□□□□□

```
# python

Python 2.6.6 □r266□84292□ Jul 10 2013□ 22□48□45□

[GCC 4.4.7 20120313 □Red Hat 4.4.7-3□] on linux2

Type "help"□ "copyright"□ "credits" or "license" for more
information.
```

```
>>> import pexpect

>>>
```

□□□□□□SSH□□□□□□□□□□

```
import pexpect

child = pexpect.spawn□'scp foo user@example.com□.'□ #spawn□
□scp□□

child.expect□'Password□'□ #expect□□□□□□□□□□□□□□□□□□□□□□□□□

                          #'Password□'

child.sendline□mypassword□ #□□□□□□□□□□□□□
```

5.2 pexpect□□□□□

□□□□pexpect□□□□□□□□□spawn□□run□□□□□□pxssh□□□□□□□□□□

5.2.1 spawn□

spawn□pexpect□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

```
class pexpect.spawn□command□ args=[]□ timeout=30□
maxread=2000□ searchwindowsize=None□ logfile=None□
cwd=None□ env=None□ ignore_sighup=True□
```

□□command□□□□□□□□□□□□□□□□□□

```
child = pexpect.spawn□'/usr/bin/ftp'□ #□□ftp□□□□□

child = pexpect.spawn□'/usr/bin/ssh user@example.com'□ #□□
ssh□□□□□□

child = pexpect.spawn□'ls -latr /tmp'□ #□□ls□□/tmp□□□□□□
```

□□□□□□□□□□□□□□□Python□□□□□□□□□□□

```
child = pexpect.spawn □'/usr/bin/ftp'□ []□

child = pexpect.spawn □'/usr/bin/ssh'□
['user@example.com']□

child = pexpect.spawn □'ls'□ ['-latr'□ '/tmp']□
```

[illegible]timeout[illegible]maxread[illegible] pexpect[illegible] searchwindowsize[illegible]

[illegible]pexpect[illegible]shell[illegible]“>”[illegible]“|”[illegible]“*”[illegible]/bin/bash[illegible]

```
child = pexpect.spawn□'/bin/bash -c "ls -l | grep LOG >
logs.txt"'□

child.expect□pexpect.EOF□
```

[illegible]Python[illegible]

```
shell_cmd = 'ls -l | grep LOG > logs.txt'

child = pexpect.spawn□'/bin/bash'□ ['-c'□ shell_cmd]□

child.expect□pexpect.EOF□
```

[illegible]pexpect[illegible]pexpect[illegible]

```
child = pexpect.spawn（'some_command'）

fout = file（'mylog.txt'，'w'）

child.logfile = fout
```

[illegible]

```
child = pexpect.spawn（'some_command'）

child.logfile = sys.stdout
```

[illegible]SSH[illegible]/home[illegible]

```
import pexpect

import sys

child = pexpect.spawn（'ssh root@192.168.1.21'）

fout = file（'mylog.txt'，'w'）

child.logfile = fout

#child.logfile = sys.stdout

child.expect（"password："）

child.sendline（"U3497DT32t"）

child.expect（'#'）

child.sendline（'ls /home'）

child.expect（'#'）
```

□□□mylog.txt□□□□□□□□□pexpect□□□□□□□□□
□□□□

```
# cat mylog.txt

root@192.168.1.21's password□ U3497DT32t

Last login□ Tue Jan  7 23□05□30 2014 from 192.168.1.20

[root@SN2013-08-021 ~]# ls /home

ls /home

cc.py           poster-0.8.1
tarfile.tar.gz  zipfile.zip

default.tar.gz  poster-0.8.1.tar.gz           test.sh

dev             pypa-setuptools-c508be8585ab  zipfile1.zip
```

□1□expect□□

expect□□□□□□□□□□□□□□□□

□□□□□expect□pattern□timeout=–1□
searchwindowsize=–1□

□□□□□pattern□□□□□□pexpect.EOF□□□□□□□
□□□□□□□□pexpect.TIMEOUT□□□□□□□□□□□□□
□□□□□□□□□□□□□□□List□□□pattern□□□□□□□□
□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
□□□□□□□□□□□□□□□ID□□□□

```
import pexpect

child = pexpect.spawn□"echo 'foobar'"□

print child.expect□['bar'□ 'foo'□ 'foobar']□

□□□1□□'foo'□□□
```

□□timeout□□□□□□□□□□□□□□□□□□□□□□□□□□□expect□□□□pexpect.TIMEOUT□□□searchwindowsize□□□□□□□□□□□□□□□□□□□□□□□□

□pexpect.EOF□pexpect.TIMEOUT□□expect□□□□□□□□□□□□□□□□□□□□□ID□□□□

```
index = p.expect□['good'□ 'bad'□ pexpect.EOF□
pexpect.TIMEOUT]□

if index == 0□

    do_something□□

elif index == 1□

    do_something_else□□

elif index == 2□

    do_some_other_thing□□

elif index == 3□

    do_something_completely_different□□
```

□□□□□□□

```
try□
    index = p.expect□['good'□ 'bad']□
    if index == 0□
        do_something□□
    elif index == 1□
        do_something_else□□
except EOF□
    do_some_other_thing□□
except TIMEOUT□
    do_something_completely_different□□
```

expect□□□□□□□□□□□□before□after□before□□□□□□□□□□□□□□□□□after□□□□□□□□□□□□□□□□□□□□

```
import pexpect
import sys
child = pexpect.spawn□'ssh root@192.168.1.21'□
fout = file□'mylog.txt'□'w'□
child.logfile = fout
child.expect□["password□"]□
child.sendline□"980405"□
print "before□"+child.before
print "after□"+child.after
```

□□□□□□□

```
before□root@192.168.1.21's

after□password□
```

□2□read□□□□

□□□

```
send□self□ s□ □□□□□□□□

sendline□self□ s=''□ □□□□□□□

sendcontrol□self□ char□ □□□□□□□□child.sendcontrol□'c'□□□
□”ctrl+c”

sendeof□□ □□eof
```

5.2.2 run□□

run□□□pexpect□□□□□□□□□□□□□□□□□□os.system□os.popen□□□□□□□□□□run□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□pexpect.run□command□timeout=–1□withexitstatus=False□events=None□

extra_args=None□logfile=None□
cwd=None□env=None□□

□□command□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□events□□□□□□□□□expect□sendline□□□□□□□□spawn□□□□□□□□

```
from pexpect import *

child = spawn□'scp foo user@example.com□.'□

child.expect□'□□i□password'□

child.sendline□mypassword□
```

□□run□□□□□□□□□□□□□□□□□□□

```
from pexpect import *

run□'scp foo user@example.com□.'□ events={'□□i□password'□
mypassword}□
```

5.2.3 pxssh□

pxssh□pexpect□□□□□□□□ssh□□□□□□□□□□□□□□□□□□□□□□□□□□□

pxssh□□□□

```
class pexpect.pxssh.pxssh□timeout=30□ maxread=2000□
searchwindowsize=None□ logfile=None□ cwd=None□ env=None□
```

pxssh□□□□□□□□□□

·login□□□□ssh□□□

·logout□□□□□□□

·prompt□□□□□□□□□□□□□□□□□□□□□

□□□□pxssh□□□□□ssh□□□□□□□□□□□□□□□□□□□login□□□□□□□□□□□□□□□□□sendline□□□□□□□□□□□□prompt□□□□□□□□□□□□□□□□□□□□□□□□□logout□□□□□□□□□

□/home/test/pexpect/simple1.py□

```
import pxssh

import getpass

try□

    s = pxssh.pxssh□□    #□□pxssh□□s

    hostname = raw_input□'hostname□ '□

    username = raw_input□'username□ '□

    password = getpass.getpass□'please input password□ '□ #
□□□□□□

    s.login □hostname□ username□ password□ #□□ssh□□

    s.sendline □'uptime'□  # □□uptime□□

    s.prompt□□             # □□□□□□□
    print s.before          # [illegible]
    s.sendline （'ls -l'）
    s.prompt（）
    print s.before
    s.sendline （'df'）
    s.prompt（）
    print s.before
    s.logout（） #[illegible]ssh[illegible]
except pxssh.ExceptionPxssh， e：
    print "pxssh failed on login."
    print str（e）
```

5.3 pexpect□□□□

□□□□□□□□pexpect□□□□□□□□□□□□□□□□□FTP□□□□□□□□□□□□SSH□□□□□□□□□□□□□□□□□□□□□□□□□

5.3.1 □□□□□□□FTP□□

□□□□FTP□□□pexpect□□□spawnu□□□□□□FTP□□□□□expect□□□□□□□□□□□□□□sendline□□□□□□□□FTP□□□□□□□□□□□□□

□/home/test/pexpect/simple2.py□

```
from __future__ import unicode_literals  #□□unicode□□
import pexpect
import sys
child = pexpect.spawnu□'ftp ftp.openbsd.org'□  #□□ftp□□
child.expect□'□□i□name .*□ '□  #□□i□□□□□□□□□□□□□□□□□□
child.sendline□'anonymous'□  #□□ftp□□□□
child.expect□'□□i□password'□ #□□□□□□□□
child.sendline□'pexpect@sourceforge.net'□  #□□ftp□□
child.expect□'ftp> '□
child.sendline□'bin'□  #□□□□□□□□□

child.expect□'ftp> '□

child.sendline□'get robots.txt'□  #□□robots.txt□□

child.expect□'ftp> '□

sys.stdout.write □child.before□  #□□□□“ftp> ”□□□□□□□□

print□"Escape character is '^]'.\n"□

sys.stdout.write □child.after□

sys.stdout.flush□□

#□□ interact□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□“^]”□□□□

child.interact□□

child.sendline□'bye'□

child.close□□
```

□□□□□□

```
get robots.txt

local□ robots.txt remote□ robots.txt

227 Entering Passive Mode □129□128□5□191□197□243□

150 Opening BINARY mode data connection for 'robots.txt'
□26 bytes□.

226 Transfer complete.

26 bytes received in 3.29 secs □0.01 Kbytes/sec□

Escape character is '^]'.

ftp>  #□□interact□□□□□□□□□□□□□□□□□□
```

5.3.2 □□□□□□□□□□□

□Linux□□□□□□□□□□□□□□□□□□□Linux□□□□□□□□□□□□□□□□□□□□□□spawn□□□□□□ssh□scp□□□□□□□□□□□□□□□□□□

□/home/test/pexpect/simple3.py□

```
import pexpect

import sys

ip="192.168.1.21"  #□□□□□

user="root"  #□□□□□

passwd="H6DSY#*$df32"  #□□□□□

target_file="/data/logs/nginx_access.log"  #□□□□nginx□□□□

child = pexpect.spawn□'/usr/bin/ssh'□ [user+'@'+ip]□  #□□
ssh□□

fout = file□'mylog.txt'□'w'□  #□□□□□□□□□mylog.txt□□

child.logfile = fout

try□

    child.expect□'□□i□password'□  #□□password□□□□□i□□□□□□
□□

    child.sendline□passwd□

    child.expect□'#'□

    child.sendline□'tar -czf /data/nginx_access.tar.gz
'+target_file□ #□□nginx
```

```
          #□□□□
    child.expect□'#'□
    print child.before
    child.sendline□'exit'□
    fout.close□□
except EOF□  #□□EOF□□□□
    print "expect EOF"
except TIMEOUT□  #□□TIMEOUT□□□□
    print "expect TIMEOUT"
child = pexpect.spawn□'/usr/bin/scp'□
[user+'@'+ip+'□/data/nginx_access.tar.gz'□'/home']□  #□□scp
□□□□□□□□□□□□□□nginx□□□□□□/home□□
fout = file□'mylog.txt'□'a'□
child.logfile = fout
try□
    child.expect□'□□i□password'□
    child.sendline□passwd□
    child.expect□pexpect.EOF□  #□□□□□EOF□□□□□□□□□□□□□□□
except EOF□
    print "expect EOF"
except TIMEOUT□
    print "expect TIMEOUT"
```

□□□□ 5.2□□5.3□□□□□□□□□□□□□ http://pexpect.readthedocs.org/en/latest/□

[illegible]6[illegible] [illegible]paramiko[illegible]

paramiko[illegible]Python[illegible]SSH2[illegible]SSH[illegible]Pexpect[illegible]SSH[illegible]http://www.paramiko.org[illegible]1.13[illegible]

6.1 paramiko□□□

paramiko□□pip□easy_install□□pip□easy_install□□

```
pip install paramiko

easy_install paramiko
```

paramiko□□□□□□Crypto□Ecdsa□□Python□□□python-devel□□□□□□□□□□□□□

```
# yum -y install python-devel

# wget
http□//ftp.dlitz.net/pub/dlitz/crypto/pycrypto/pycrypto-
2.6.tar.gz

# tar -zxvf pycrypto-2.6.tar.gz

# cd pycrypto-2.6

# python setup.py install

# cd ..

# wget
https□//pypi.python.org/packages/source/e/ecdsa/ecdsa-
0.10.tar.gz --no-check-certificate

# tar -zxvf ecdsa-0.10.tar.gz

# cd ecdsa-0.10
# python setup.py install

# cd ..

# wget
https□//github.com/paramiko/paramiko/archive/v1.12.2.tar.gz

# tar -zxvf v1.12.2.tar.gz

# cd paramiko-1.12.2/

# python setup.py install
```

□□□□□□□□□□□□□□□□□□□□□□□□□

```
# python

Python 2.6.6 □r266□84292□ Jul 10 2013□ 22□48□45□

[GCC 4.4.7 20120313 □Red Hat 4.4.7-3□] on linux2

Type "help"□ "copyright"□ "credits" or "license" for more
information.

>>> import paramiko

>>>
```

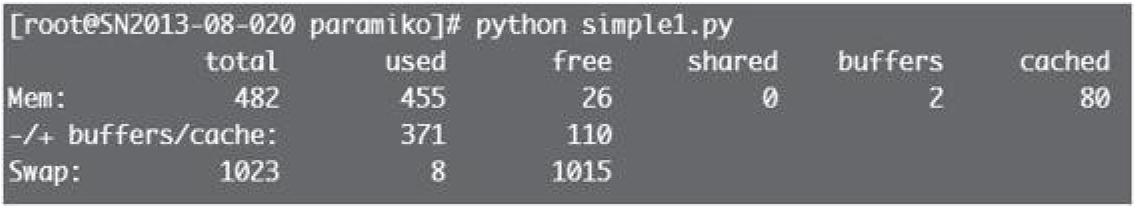
□□□□□□□□□□□□SSH□□□□□□□□□□□□□□□□□□□□□□exec_command□□□□□□□□□□□□□□□□

□/home/test/paramiko/simple1.py□

```
#□/usr/bin/env python

import paramiko
```

```
hostname='192.168.1.21'

username='root'

password='SKJh935yft#'

paramiko.util.log_to_file□'syslogin.log'□ #□□paramiko□□□
syslogin.log□□

ssh=paramiko.SSHClient□□ #□□□□ssh□□□client□□

ssh.load_system_host_keys□□ #□□□□□host_keys□□□
~/.ssh/known_hosts□□□□□

                                            #□□□□

ssh.connect□hostname=hostname□username=username□
password=password□ #□□ssh□□

stdin□stdout□stderr=ssh.exec_command□'free -m'□ #□□□□□□□□□□
exec_command□□

print stdout.read□□  #□□□□□□□□□□□Python□□□□□□□□□
stdout.readlines□□

ssh.close□□  #□□ssh□□
```

□□□□□□□□□□□6-1□□□



```
[root@SN2013-08-020 paramiko]# python simple1.py
             total       used       free     shared    buffers     cached
Mem:           482        455         26          0          2         80
-/+ buffers/cache:        371        110
Swap:         1023          8       1015
```

□6-1　□□□□□□

6.2 paramiko[illegible]

paramiko[illegible]SSHClient[illegible]SFTPClient[illegible]

6.2.1 SSHClient[illegible]

SSHClient[illegible]SSH[illegible]transport[illegible]channel[illegible]SFTPClient[illegible]

```
client = SSHClient[illegible]

client.load_system_host_keys[illegible]

client.connect[illegible]'ssh.example.com'[illegible]

stdin[illegible] stdout[illegible] stderr = client.exec_command[illegible]'ls -l'[illegible]
```

[illegible]SSHClient[illegible]

1.connect[illegible]

connect[illegible]SSH[illegible]

[illegible]

```
connect[illegible]self[illegible] hostname[illegible] port=22[illegible] username=None[illegible]
password=None[illegible] pkey=None[illegible] key_filename=None[illegible] timeout=None[illegible]
allow_agent=True[illegible] look_for_keys=True[illegible] compress=False[illegible]
```

[illegible]

·hostname[illegible]str[illegible]

·port[illegible]int[illegible]22[illegible]

·username[illegible]str[illegible]

·password[illegible]str[illegible]

·pkey[illegible]PKey[illegible]

·key_filename[illegible]str or list[illegible]str[illegible]

·timeout[illegible]float[illegible]TCP[illegible]

·allow_agent[illegible]bool[illegible]False[illegible]SSH[illegible]

·look_for_keys[illegible]bool[illegible]False[illegible]~/.ssh[illegible]

·compress[illegible]bool[illegible]True[illegible]

2.exec_command[illegible]

[illegible]stdin[illegible]stdout[illegible]stderr[illegible]Python[illegible]

```
exec_command（self， command， bufsize=-1）
```

[illegible]

·command[illegible]str[illegible]

·bufsize[illegible]int[illegible]–1[illegible]

3.load_system_host_keys[illegible]

[illegible]~/.ssh/known_hosts[illegible]

```
load_system_host_keys（self， filename=None）
```

[illegible]

filename[illegible]str[illegible]

4.set_missing_host_key_policy[illegible]

[illegible]HostKeys[illegible]AutoAddPolicy[illegible]RejectPolicy[illegible]WarningPolicy[illegible]SSHClient[illegible]

·AutoAddPolicy[illegible]HostKeys[illegible]load_system_host_keys[illegible]~/.ssh/known_hosts[illegible]

·RejectPolicy[illegible]load_system_host_keys[illegible]

·WarningPolicy[illegible]Python[illegible]AutoAddPolicy[illegible]

[illegible]

```
ssh=paramiko.SSHClient[illegible]

ssh.set_missing_host_key_policy[illegible]paramiko.AutoAddPolicy[illegible]
```

6.2.2 SFTPClient[illegible]

SFTPClient[illegible]SFTP[illegible]SSH[illegible]sftp[illegible]SFTPClient[illegible]

1.from_transport[illegible]

[illegible]SFTP[illegible]

```
from_transport[illegible]cls[illegible] t[illegible]
```

□□□□□

t□Transport□□□□□□□□□□□□□□□

□□□□□

```
t = paramiko.Transport□□"192.168.1.22"□22□□

t.connect□username="root"□ password="KJSdj348g"□

sftp =paramiko.SFTPClient.from_transport□t□
```

2.put□□

□□□□□□□□□SFTP□□□□□□□□□

```
put□self□ localpath□ remotepath□ callback=None□
confirm=True□
```

□□□□□

·localpath□str□□□□□□□□□□□□□□□□

·remotepath□str□□□□□□□□□□□□□

·callback□function□int□int□□□□□□□□□□□□□□
□□□□□□□□□□□□□□□□□□None□

·confirm□bool□□□□□□□□□□□□□□□stat□□□□□□
□□□□□□□□□

□□□□□

```
localpath='/home/access.log'

remotepath='/data/logs/access.log'

sftp.put□localpath□remotepath□
```

3.get□□

□□□SFTP□□□□□□□□□□□□□□□□

```
get□self□ remotepath□ localpath□ callback=None□
```

□□□□□

·remotepath□str□□□□□□□□□□□□□□□□

·localpath□str□□□□□□□□□□□□□

·callback□function□int□int□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□None□

□□□□□

```
remotepath='/data/logs/access.log'

localpath='/home/access.log'

sftp.get□remotepath□ localpath□
```

4.□□□□

SFTPClient□□□□□□□□□□

·Mkdir□□SFTP□□□□□□□□□□sftp.mkdir□"/home/userdir"□0755□□

·remove□□□SFTP□□□□□□□□□□sftp.remove□"/home/userdir"□□

·rename□□□□SFTP□□□□□□□□□□□
sftp.rename
□"/home/test.sh"□"/home/testfile.sh"□□

·stat□□□□□SFTP□□□□□□□□□□□□sftp.stat□"/home/testfile.sh"□□

·listdir□□□□□SFTP□□□□□□□□□□□□Python□□□□List□□□□□□□sftp.listdir□"/home"□□

5.SFTPClient□□□□□

□□□SFTPClient□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□put□get□□□□□□□□□□□□□□□□□□□□□□

```
#□/usr/bin/env python

import paramiko

username = "root"
```

```
password = "KJsd8t34d"

hostname = "192.168.1.21"

port = 22

try□

    t = paramiko.Transport□□hostname□ port□□

    t.connect□username=username□ password=password□

    sftp =paramiko.SFTPClient.from_transport□t□

    sftp.put□"/home/user/info.db"□ "/data/user/info.db"□  #□□□□

    sftp.get□"/data/user/info_1.db"□ "/home/user/info_1.db"□  #□□□□

    sftp.mkdir□"/home/userdir"□0755□  #□□□□

    sftp.rmdir□"/home/userdir"□  #□□□□

    sftp.rename□"/home/test.sh"□"/home/testfile.sh"□  #□□□□□

    print sftp.stat□"/home/testfile.sh"□  #□□□□□□

    print sftp.listdir□"/home"□  #□□□□□□

    t.close□□□

except Exception□ e□

    print str□e□
```

6.3 paramiko□□□□

6.3.1 □□□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ 9.2.5□□□□□□□□□□□□□□□“~/.ssh/id_rsa”□□□□ □□□□□□□□□□“/home/key/id_rsa”□□□ paramiko.RSAKey.from_private_key_file□□□ □□□□□□□□□□□

□/home/test/paramiko/simple2.py□

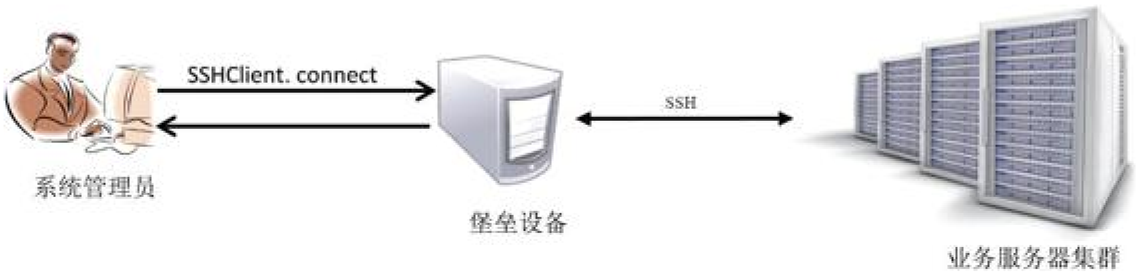
```
#□/usr/bin/env python

import paramiko

import os

hostname='192.168.1.21'

username='root'

paramiko.util.log_to_file□'syslogin.log'□

ssh=paramiko.SSHClient□□

ssh.load_system_host_keys□□

privatekey = os.path.expanduser□'/home/key/id_rsa'□  #□□□□□
□□□

key = paramiko.RSAKey.from_private_key_file□privatekey□  #□
□□□□□key

ssh.connect□hostname=hostname□username=username□pkey = key□
```

```
stdin[illegible]stdout[illegible]stderr=ssh.exec_command[illegible]'free -m'[illegible]

print stdout.read[illegible]

ssh.close[illegible]
```

[illegible]6-1[illegible]

6.3.2 [illegible]

[illegible]SSH[illegible]SSH[illegible]SSH[illegible]6-2[illegible]



[illegible]6-2 [illegible]

[illegible]paramiko[illegible]invoke_shell[illegible]SSHClient.connect[illegible]SSH[illegible]session[illegible]“ssh user@IP”[illegible]

[illegible]/home/test/paramiko/simple3.py[illegible]

```
#□/usr/bin/env python

import paramiko

import os□sys□time

blip="192.168.1.23"    #□□□□□□□

bluser="root"

blpasswd="KJsdiug45"

hostname="192.168.1.21"    #□□□□□□□□□

username="root"

password="IS8t5jgrie"

port=22

passinfo='\'s password□ '    #□□□□□□□□□□□□

paramiko.util.log_to_file□'syslogin.log'□

ssh=paramiko.SSHClient□□    #ssh□□□□□

ssh.set_missing_host_key_policy□paramiko.AutoAddPolicy□□□

ssh.connect□hostname=blip□username=bluser□
password=blpasswd□

channel=ssh.invoke_shell□□    #□□□□□□□□□□□

channel.settimeout□10□    #□□□□□□□□□□□□□□□

buff = ''

resp = ''

channel.send□'ssh '+username+'@'+hostname+'\n'□    #□□ssh□□
□□□□

while not buff.endswith□passinfo□□    #ssh□□□□□□□□□□□□□□□
□"\'s password□"□
```

```
    try□                                        #□□while□□

        resp = channel.recv□9999□

    except Exception□e□

        print 'Error info□%s connection time.' % □str□e□□

        channel.close□□

        ssh.close□□

        sys.exit□□

    buff += resp

    if not buff.find□'yes/no'□==-1□    #□□□□□□"yes/no"□□
□"yes"□□□

        channel.send□'yes\n'□

        buff=''

channel.send□password+'\n'□    #□□□□□□□□

buff=''

while not buff.endswith□'# '□□    #□□□□□"# "□□□□□□□□□□while
□□

    resp = channel.recv□9999□

    if not resp.find□passinfo□==-1□    #□□□□□□"\'s
password□ "□□□□□□□□□

                                                  #□□□□□□

        print 'Error info□ Authentication failed.'

        channel.close□□    #□□□□□□□□□

        ssh.close□□

        sys.exit□□
    buff += resp
channel.send□'ifconfig\n'□    #□□□□□□□ifconfig□□□□□□□
buff=''
try□
    while buff.find□'# '□==-1□
        resp = channel.recv□9999□
        buff += resp
except Exception□ e□
    print "error info□"+str□e□
print buff    #□□□□□
channel.close□□
ssh.close□□
```

□□□□□□□

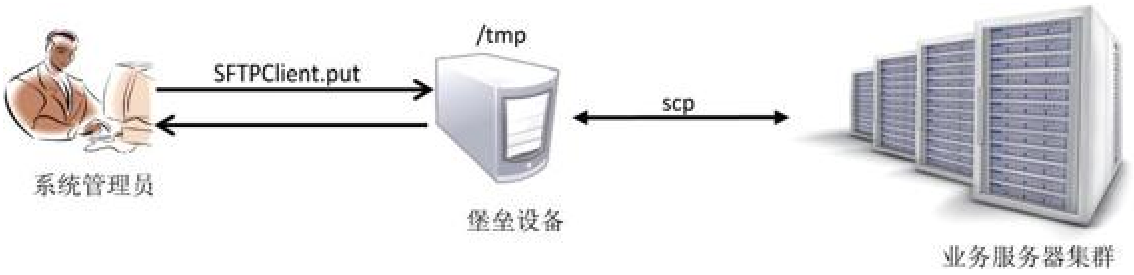
```
# python /home/test/paramiko/simple3.py
ifconfig
eth0      Link encap□Ethernet  HWaddr 00□50□56□28□63□2D
          inet addr□192.168.1.21  Bcast□192.168.1.255
Mask□255.255.255.0
          inet6 addr□ fe80□□250□56ff□fe28□632d/64 Scope□
Link
          UP BROADCAST RUNNING MULTICAST  MTU□1500  Metric□
1
          RX packets□3523007 errors□0 dropped□0 overruns□0
```

```
frame□0
          TX packets□6777657 errors□0 dropped□0 overruns□0
carrier□0
          collisions□0 txqueuelen□1000
          RX bytes□606078157 □578.0 MiB□  TX bytes□
1428493484 □1.3 GiB□
lo        Link encap□Local Loopback
          inet addr□127.0.0.1  Mask□255.0.0.0
… …
```

□□“inet addr□192.168.1.21”□□□□□□□□□□□

6.3.3 □□□□□□□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□□paramiko□SFTPClient□□□□□□□□□□□□□□□□□□□□□□□□/tmp□□□□SSHClient□invoke_shell□□□□ssh□□□□□scp□□□□/tmp□□□□□□□□□□□□□□□□□□□□□6-3□□□



□6-3 □□□□□□□□□□

□□□□□□□sftp.put□□□□□□□□□□□□□□□□□□□□send□□□□□□scp□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/home/test/paramiko/simple4.py□

```
#□/usr/bin/env python

import paramiko

import os□sys□time

blip="192.168.1.23"    #□□□□□□□

bluser="root"

blpasswd=" IS8t5jgrie"

hostname="192.168.1.21"    #□□□□□□□□□

username="root"

password=" KJsdiug45"

tmpdir="/tmp"

remotedir="/data"

localpath="/home/nginx_access.tar.gz"    #□□□□□□□

tmppath=tmpdir+"/nginx_access.tar.gz"    #□□□□□□□

remotepath=remotedir+"/nginx_access_hd.tar.gz"    #□□□□□□□□

port=22

passinfo='\'s password□ '

paramiko.util.log_to_file□'syslogin.log'□

t = paramiko.Transport□□blip□ port□□
```

```
t.connect□username=bluser□ password=blpasswd□

sftp =paramiko.SFTPClient.from_transport□t□

sftp.put□localpath□ tmppath□    #□□□□□□□□□□□□□□□

sftp.close□□

ssh=paramiko.SSHClient□□

ssh.set_missing_host_key_policy□paramiko.AutoAddPolicy□□□

ssh.connect□hostname=blip□username=bluser□
password=blpasswd□

channel=ssh.invoke_shell□□

channel.settimeout□10□

buff = ''

resp = ''

#scp□□□□□□□□□□□

channel.send□'scp '+tmppath+'
'+username+'@'+hostname+'□'+remotepath+'\n'□

while not buff.endswith□passinfo□□

    try□

        resp = channel.recv□9999□

    except Exception□e□

        print 'Error info□%s connection time.' % □str□e□□

        channel.close□□

        ssh.close□□

        sys.exit□□
    buff += resp
    if not buff.find□'yes/no'□==-1□
        channel.send□'yes\n'□
        buff=''
channel.send□password+'\n'□
buff=''
while not buff.endswith□'# '□□
    resp = channel.recv□9999□
    if not resp.find□passinfo□==-1□
        print 'Error info□ Authentication failed.'
        channel.close□□
        ssh.close□□
        sys.exit□□
    buff += resp
print buff
channel.close□□
ssh.close□□
```

□□□□□□□□□□/data/nginx_access_hd.tar.gz□□□□□□□□□□□

```
# python /home/test/paramiko/simple4.py
```

```
nginx_access.tar.gz                                100% 1590KB
1.6MB/s   00□00
```

[illegible]

[illegible] 6.2[illegible]6.3[illegible]
http://docs.paramiko.org/en/1.13/[illegible]

□7□ □□□□□□□□□Fabric□□

Fabric□□□Python□2.5□□□□□□□□□SSH□□□□□□□□□SSH□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□shell□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Fabric□paramiko□□□□□□□□□□□□□□□□□□□□□□□□Fabric□□□□□□ http://www.fabfile.org□□□□□□□□1.8□

7.1 Fabric□□□

Fabric□□pip□easy_install□□pip□easy_install□□

```
pip install fabric

easy_install fabric
```

Fabric□□□□□□setuptools□Crypto□paramiko□□□□□□□□□□□□□□

```
# yum -y install python-setuptools

# wget
https□//pypi.python.org/packages/source/F/Fabric/Fabric-
1.8.2.tar.gz --no-check-certificate

# tar -zxvf Fabric-1.8.2.tar.gz

# cd Fabric-1.8.2

# python setup.py install
```

□□□□□□□□□□□□□□□□□□□□□□□□□□□□

```
# python

Python 2.6.6 □r266□84292□ Jul 10 2013□ 22□48□45□

[GCC 4.4.7 20120313 □Red Hat 4.4.7-3□] on linux2
```

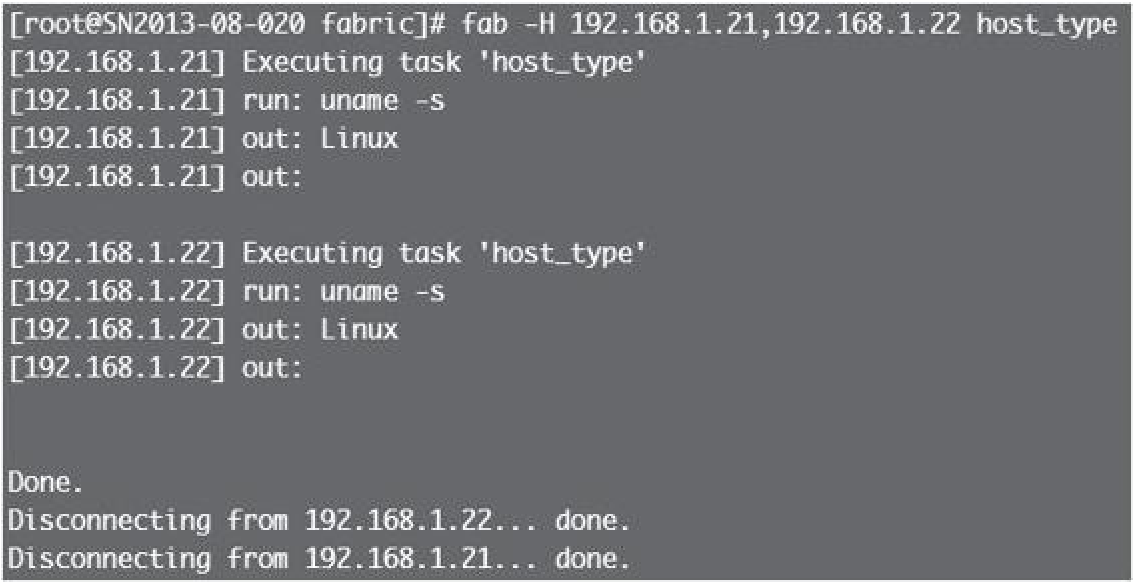
```
Type "help"□ "copyright"□ "credits" or "license" for more
information.

>>> import fabric

>>>
```

□□□□□□□□□□□□□□□

□/home/test/fabric/fabfile.py□

```
#□/usr/bin/env python

from fabric.api import run

def host_type□□□    #□□□□□□□□□□□run□□□□□□□□‘uname -s’□□

    run□'uname -s'□
```

□□□□□□7-1□□□



```
[root@SN2013-08-020 fabric]# fab -H 192.168.1.21,192.168.1.22 host_type
[192.168.1.21] Executing task 'host_type'
[192.168.1.21] run: uname -s
[192.168.1.21] out: Linux
[192.168.1.21] out:

[192.168.1.22] Executing task 'host_type'
[192.168.1.22] run: uname -s
[192.168.1.22] out: Linux
[192.168.1.22] out:


Done.
Disconnecting from 192.168.1.22... done.
Disconnecting from 192.168.1.21... done.
```

[illegible]7-1 [illegible]

[illegible]fab[illegible]fabfile.py[illegible]“-f”[illegible]fab-H SN2013-08-021[illegible]SN2013-08-022-f host_type.py host_type[illegible]

7.2 fab[illegible]

fab[illegible]Fabric[illegible]

```
fab [options] <command>[[illegible]arg1[illegible]arg2=val2[illegible]host=foo[illegible]hosts='h1[illegible]
h2'[illegible]...] ...
```

[illegible]fab-help[illegible]

·-l[illegible]

·-f[illegible]fab[illegible]fabfile.py[illegible]

·-g[illegible]IP[illegible]

·-H[illegible]“[illegible]”[illegible]

·-P[illegible]

·-R[illegible]role[illegible]

·-t[illegible]

·-T[illegible]

·-w[illegible]

[illegible]Python[illegible]

```
# fab -p Ksdh3458d[illegible] -H 192.168.1.21[illegible]192.168.1.22 --
'uname -s'
```

[illegible]7-1[illegible]

7.3 fabfile□□□

fab□□□□□□□□□□fabfile.py□□□□□□□□□-f filename□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□“-H 192.168.1.21□192.168.1.22”□□□□□□□□□env.hosts□□□□□“env.hosts=['192.168.1.21'□'192.168.1.22']”□fabfile□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

7.3.1 □□□□□□

evn□□□□□□□□fabfile□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

·env.host□□□□□□□□□□□IP□□□□□□□□Python□□□□□□□□□env.hosts=['192.168.1.21'□'192.168.1.22']□

·env.exclude_hosts□□□□□□□□□env.exclude_hosts=['192.168.1.22']□

·env.user□□□□□□□□env.user="root"□

·env.port□□□□□□□□□□□□□22□□env.port="22"□

·env.password[illegible] env.password='KSJ3548t7d'[illegible]

·env.passwords[illegible]password[illegible]passwords[illegible]

```
env.passwords = {

    'root@192.168.1.21[illegible]22'[illegible] 'SJk348ygd'[illegible]

    'root@192.168.1.22[illegible]22'[illegible] 'KSh458j4f'[illegible]

    'root@192.168.1.23[illegible]22'[illegible] 'KSdu43598'

}
```

·env.gateway[illegible]IP[illegible] env.gateway='192.168.1.23'[illegible]

·env.deploy_release_dir[illegible] env.+“[illegible]”[illegible]env.deploy_release_dir[illegible] env.age[illegible]env.sex[illegible]

·env.roledefs[illegible]web[illegible]db[illegible]

```
env.roledefs = {

    'webservers'[illegible] ['192.168.1.21'[illegible] '192.168.1.22'[illegible]
'192.168.1.23'[illegible] '192.168.1.24'][illegible]
```

```
    'dbservers'□ ['192.168.1.25'□ '192.168.1.26']
}
```

□□□□□Python□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

```
@roles□'webservers'□
def webtask□□□
    run□'/etc/init.d/nginx start'□
@roles□'dbservers'□
def dbtask□□□
    run□'/etc/init.d/mysql start'□
@roles □'webservers'□ 'dbservers'□
def pubclitask□□□
    run□'uptime'□
def deploy□□□
    execute□webtask□
    execute□dbtask□
    execute□pubclitask□
```

□□□□□□#fab deploy□□□□□□□□□□□□□□□□□□□□

7.3.2　□□API

Fabric[illegible]fabric.api[illegible]API[illegible]Fabric[illegible]

·local[illegible]local[illegible]'uname-s'[illegible]

·lcd[illegible]lcd[illegible]'/home'[illegible]

·cd[illegible]cd[illegible]'/data/logs'[illegible]

·run[illegible]run[illegible]'free-m'[illegible]

·sudo[illegible]sudo[illegible]sudo [illegible]'/etc/init.d/httpd start'[illegible]

·put[illegible]put [illegible]'/home/user.info'[illegible]'/data/user.info'[illegible]

·get[illegible]get [illegible]'/data/user.info'[illegible]'/home/root.info'[illegible]

·prompt[illegible]prompt[illegible]'please input user password[illegible]'[illegible]

·confirm[illegible]confirm[illegible]"Tests failed.Continue[Y/N][illegible]"[illegible]

·reboot[illegible]reboot[illegible]

·@task[illegible]fab[illegible]fab[illegible]

·@runs_once□□□□□□□□□□□□□□□□□□□□□□□□□
□□□

□□□□□□□□□□□□□□□□□□□□API□

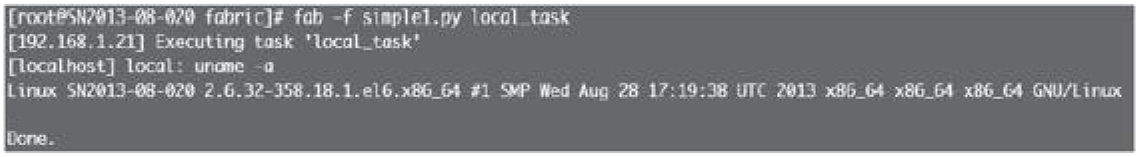
7.3.3 □□1□□□□□□□□□□□□

□□□□□local□□□□□□□□□□□□□□□□□
□“@runs_once”□□□□□□□□□□□□□□□□□□run□□
□□□□□□□□□□□□□□□□

□/home/test/fabric/simple1.py□

```
#□/usr/bin/env python

from fabric.api import *

env.user='root'

env.hosts=['192.168.1.21'□'192.168.1.22']

env.password='LKs934jh3'

@runs_once    #□□□□□□□□□□□□□□□□□□□□□

def local_task□□□    #□□□□□□

    local□"uname -a"□

def remote_task□□□

    with cd□"/data/logs"□□    #“with”□□□□□□□□□□□□□□□□□□□□□□
□

        run□"ls -l"□          # “cd /data/logs && ls -l”□□□
```

□□fab□□□□□□local_task□□□□□□□□□□7-2□□□

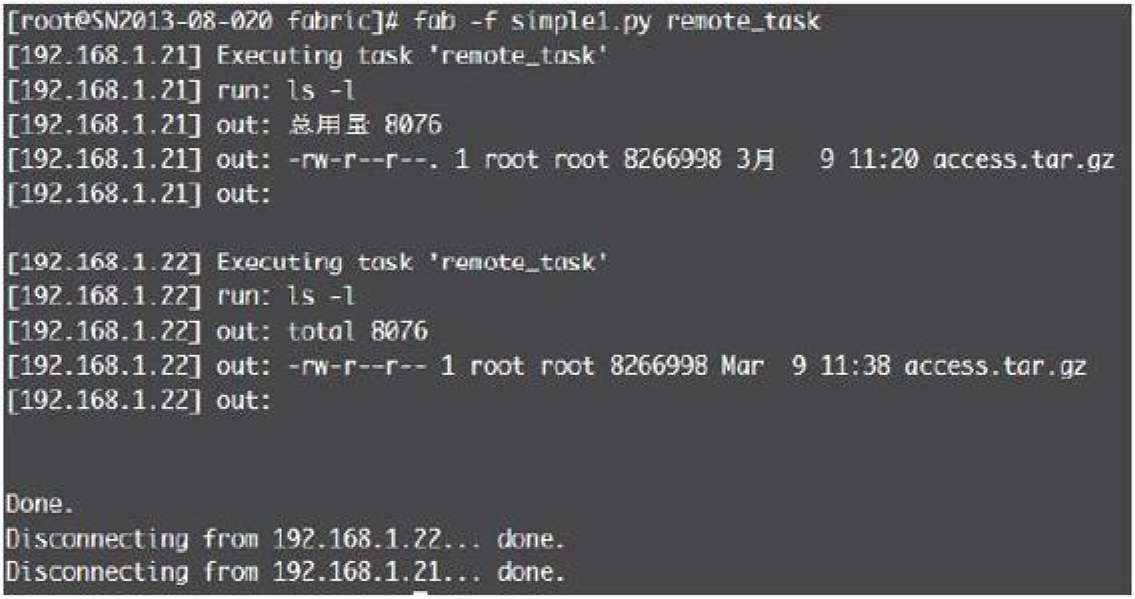


```
[root@SN2013-08-020 fabric]# fab -f simple1.py local_task
[192.168.1.21] Executing task 'local_task'
[localhost] local: uname -a
Linux SN2013-08-020 2.6.32-358.18.1.el6.x86_64 #1 SMP Wed Aug 28 17:19:38 UTC 2013 x86_64 x86_64 x86_64 GNU/Linux

Done.
```

□7-2 □□local_task□□□□□□□□

□□□□□□“[192.168.1.21]Executing task'local_task'”□□□□□□□□□□192.168.1.21□□□□□□□□□□Fabric□□□□“uname-a”□□□□□□

□□remote_task□□□□□□□□□□□7-3□□□



```
[root@SN2013-08-020 fabric]# fab -f simple1.py remote_task
[192.168.1.21] Executing task 'remote_task'
[192.168.1.21] run: ls -l
[192.168.1.21] out: 总用量 8076
[192.168.1.21] out: -rw-r--r--. 1 root root 8266998 3月   9 11:20 access.tar.gz
[192.168.1.21] out:

[192.168.1.22] Executing task 'remote_task'
[192.168.1.22] run: ls -l
[192.168.1.22] out: total 8076
[192.168.1.22] out: -rw-r--r-- 1 root root 8266998 Mar  9 11:38 access.tar.gz
[192.168.1.22] out:


Done.
Disconnecting from 192.168.1.22... done.
Disconnecting from 192.168.1.21... done.
```

□7-3 □□remote_task□□□□□□□□

7.3.4 □□2□□□□□□□□□□□

□□□□□“@task”□□□□□□□□□go□□□□□□□□□□“@runs_once”□□□□□□□□□□□□□□worktask

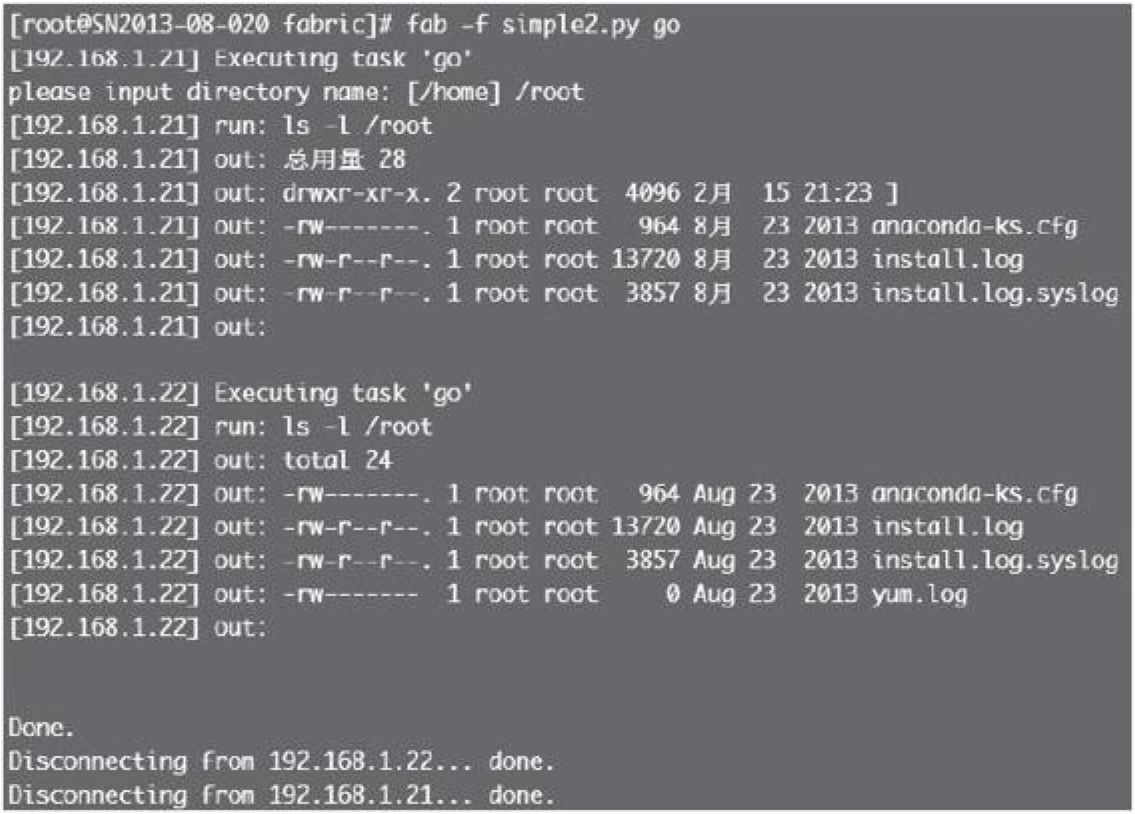
□□□□□□□□□□□□□□□□□□□□□□

□/home/test/fabric/simple2.py□

```
#□/usr/bin/env python

from fabric.api import *

env.user='root'

env.hosts=['192.168.1.21'□'192.168.1.22']

env.password='LKs934jh3'

@runs_once    #□□□□□□□□□□□□□□□□□□

def input_raw□□□

    return prompt□"please input directory name□"□
default="/home"□

def worktask□dirname□□

    run□"ls -l "+dirname□

@task    #□□□□go□□□fab□□□□

def go□□□

    getdirname = input_raw□□

    worktask□getdirname□
```

□□□input_raw□□□□□□@runs_once□□□□□□□□□□

□□□□□□7-4□□□



```
[root@SN2013-08-020 fabric]# fab -f simple2.py go
[192.168.1.21] Executing task 'go'
please input directory name: [/home] /root
[192.168.1.21] run: ls -l /root
[192.168.1.21] out: 总用量 28
[192.168.1.21] out: drwxr-xr-x. 2 root root  4096 2月  15 21:23 ]
[192.168.1.21] out: -rw-------. 1 root root   964 8月  23 2013 anaconda-ks.cfg
[192.168.1.21] out: -rw-r--r--. 1 root root 13720 8月  23 2013 install.log
[192.168.1.21] out: -rw-r--r--. 1 root root  3857 8月  23 2013 install.log.syslog
[192.168.1.21] out:

[192.168.1.22] Executing task 'go'
[192.168.1.22] run: ls -l /root
[192.168.1.22] out: total 24
[192.168.1.22] out: -rw-------. 1 root root   964 Aug 23  2013 anaconda-ks.cfg
[192.168.1.22] out: -rw-r--r--. 1 root root 13720 Aug 23  2013 install.log
[192.168.1.22] out: -rw-r--r--. 1 root root  3857 Aug 23  2013 install.log.syslog
[192.168.1.22] out: -rw-------  1 root root     0 Aug 23  2013 yum.log
[192.168.1.22] out:


Done.
Disconnecting from 192.168.1.22... done.
Disconnecting from 192.168.1.21... done.
```

□7-4　□□□□□□

7.3.5　□□3□□□□□□□□□□□□

□□□□□Fabric□env□□□□□□□□□□□□□□□□□□□□□□□□□□□“env.gateway='192.168.1.23'”□□□IP“192.168.1.23”□□□□IP□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/home/test/fabric/simple3.py□

```
#□/usr/bin/env python
from fabric.api import *
from fabric.context_managers import *
from fabric.contrib.console import confirm

env.user='root'

env.gateway='192.168.1.23'    #□□□□□IP□□□□□□□□□□□□□□□

env.hosts=['192.168.1.21'□'192.168.1.22']

#□□□□□□□□□□□□□□□□□env.passwords□□□□□□□□

env.passwords = {

    'root@192.168.1.21□22'□ 'LKs934jh3'□

    'root@192.168.1.22□22'□ 'LKs934jh3'□

    'root@192.168.1.23□22'□ 'UI7384hg6'    #□□□□□□□

}

lpackpath="/home/install/lnmp0.9.tar.gz"    #□□□□□□□

rpackpath="/tmp/install"     #□□□□□□□

@task

def put_task□□□

    run□"mkdir -p /tmp/install"□

    with settings□warn_only=True□□

        result = put□lpackpath□ rpackpath□    #□□□□□

    if result.failed and not confirm□"put file failed□
Continue[Y/N]□"□□

        abort□"Aborting file put task□"□

@task

def run_task□□□    #□□□□□□□□□lnmp□□

    with cd□"/tmp/install"□□
```

```
        run[illegible]"tar -zxvf lnmp0.9.tar.gz"[illegible]
        with cd[illegible]"lnmp0.9/"[illegible]    #[illegible]with[illegible]/tmp/install[illegible]
            run[illegible]"./centos.sh"[illegible]
@task
def go[illegible]    #[illegible]
    put_task[illegible]
    run_task[illegible]
```

[illegible]env.gateway='192.168.1.23'[illegible]paramiko[illegible]env.gateway[illegible]

7.4 Fabric[illegible]

[illegible]Fabric[illegible]

7.4.1 [illegible]1[illegible]

[illegible]put[illegible]md5[illegible]

[illegible]/home/test/fabric/simple4.py[illegible]

```
#[illegible]/usr/bin/env python
from fabric.api import *
from fabric.context_managers import *
from fabric.contrib.console import confirm
env.user='root'
env.hosts=['192.168.1.21'[illegible]'192.168.1.22']
env.password='LKs934jh3'
@task
@runs_once
def tar_task[illegible]    #[illegible]
```

```
    with lcd□"/data/logs"□□

        local□"tar -czf access.tar.gz access.log"□

@task

def put_task□□□    #□□□□□□□□

    run□"mkdir -p /data/logs"□

    with cd□"/data/logs"□□

        with settings□warn_only=True□□    #put□□□□□□□□□□□□
□□□□□

            result = put□"/data/logs/access.tar.gz"□
"/data/logs/access.tar.gz"□

        if result.failed and not confirm□"put file failed□
Continue[Y/N]□"□□

            abort□"Aborting file put task□"□    #□□□□□□□□□
□□□□□Y□□□

@task

def check_task□□□    #□□□□□□□□

    with settings□warn_only=True□□

        #□□local□□□□□□capture=True□□□□□□□

        lmd5=local□"md5sum /data/logs/access.tar.gz"□
capture=True□.split□' '□[0]

        rmd5=run□"md5sum /data/logs/access.tar.gz"□.split□'
'□[0]

    if lmd5==rmd5□    #□□□□□□□□□md5□□

        print "OK"

    else□

        print "ERROR"
```

□□

```
fab -f simple4.py tar_task    #□□□□
fab -f simple4.py put_task    #□□□□
fab -f simple4.py check_task  #□□□□
```

□□□□□□□□□□□□□□□□□□□□□□□□□go□□□□□□

```
@task
def go□□□
    tar_task□□
    put_task□□
    check_task□□
```

□□fab-f simple4.py go□□□□□□□□□□□□□□□□□□□□□

7.4.2 □□2□□□LNMP□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Web□DB□PROXY□CACHE□□□□□□□env.roledefs□□□□□□□□□□□□“@roles

□'webservers'□”□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/home/test/fabric/simple5.py□

```
#□/usr/bin/env python

from fabric.colors import *

from fabric.api import *

env.user='root'

env.roledefs = {    #□□□□□□□□

    'webservers'□ ['192.168.1.21'□ '192.168.1.22']□

    'dbservers'□ ['192.168.1.23']

}

env.passwords = {

    'root@192.168.1.21□22'□ 'SJk348ygd'□

    'root@192.168.1.22□22'□ 'KSh458j4f'□

    'root@192.168.1.23□22'□ 'KSdu43598'

}

@roles□'webservers'□    #webtask□□□□□□'webservers'□□□□□

def webtask□□□    #□□nginx php php-fpm□□□

    print yellow□"Install nginx php php-fpm..."□

    with settings□warn_only=True□□

        run□"yum -y install nginx"□
        run□"yum -y install php-fpm php-mysql php-mbstring
php-xml php-mcrypt php-gd"□

        run□"chkconfig --levels 235 php-fpm on"□

        run□"chkconfig --levels 235 nginx on"□

@roles□'dbservers'□    # dbtask□□□□□□'dbservers'□□□□□

def dbtask□□□    #□□mysql□□

    print yellow□"Install Mysql..."□

    with settings□warn_only=True□□

        run□"yum -y install mysql mysql-server"□

        run□"chkconfig --levels 235 mysqld on"□

@roles □'webservers'□ 'dbservers'□ # publictask□□□□□□□□□□□□
□□□

def publictask□□□    #□□□□□□□□□epel□ntp□

    print yellow□"Install epel ntp..."□

    with settings□warn_only=True□□

        run□"rpm -Uvh
http□//dl.fedoraproject.org/pub/epel/6/x86_64/epel-

release-6-8.noarch.rpm"□

        run□"yum -y install ntp"□

def deploy□□□

    execute□publictask□

    execute□webtask□

    execute□dbtask□
```

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
□□Python□□□□□□□□□□□□□□

7.4.3 □□3□□□□□□□□□□

□□Linux□□□□□□□□□□□□

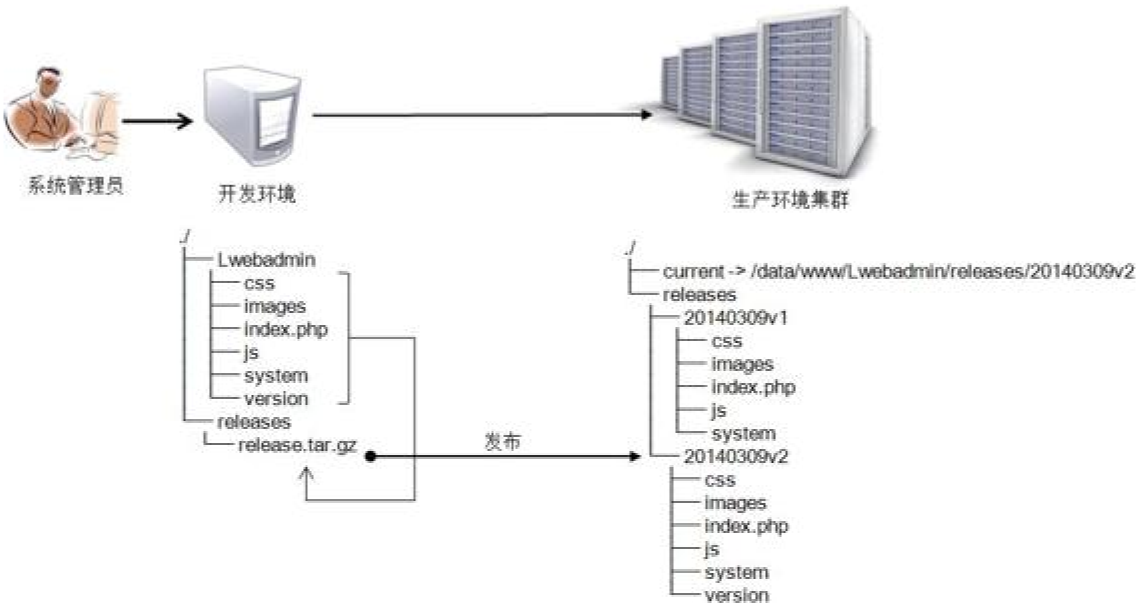
□/home/test/fabric/simple6.py□

```
#□/usr/bin/env python

from fabric.api import *

from fabric.colors import *

from fabric.context_managers import *

from fabric.contrib.console import confirm

import time

env.user='root'

env.hosts=['192.168.1.21'□'192.168.1.22']

env.password='LKs934jh3'

env.project_dev_source = '/data/dev/Lwebadmin/'    #□□□□□□□
□

env.project_tar_source = '/data/dev/releases/'    #□□□□□□□□
□□□□

env.project_pack_name = 'release'    #□□□□□□□□□□□□□
release.tar.gz
```

```
env.deploy_project_root = '/data/www/Lwebadmin/'    #□□□□□□
□□□

env.deploy_release_dir = 'releases'    #□□□□□□□□□□□□□□

env.deploy_current_dir = 'current'    #□□□□□□□□□□□□

env.deploy_version=time.strftime□"%Y%m%d"□+"v2"    #□□□

@runs_once

def input_versionid□□□    #□□□□□□□□□□□□□□□□□□□□

    return prompt□"please input project rollback version
ID□"□default=""□

@task

@runs_once

def tar_source□□□    #□□□□□□□□□□□□□□□□□□□□□□□□□

    print yellow□"Creating source package..."□

    with lcd□env.project_dev_source□□

        local□"tar -czf %s.tar.gz ." %
□env.project_tar_source + env.project_pack_name□□

    print green□"Creating source package success□"□

@task

def put_package□□□    #□□□□□□

    print yellow□"Start put package..."□

    with settings□warn_only=True□□

        with cd
□env.deploy_project_root+env.deploy_release_dir□□

            run□"mkdir %s" % □env.deploy_version□□    #□□□□
□□
```

```
    env.deploy_full_path=env.deploy_project_root +
env.deploy_release_dir +

"/"+env.deploy_version

    with settings□warn_only=True□□    #□□□□□□□□□□□

        result = put□env.project_tar_source +
env.project_pack_name +".tar.gz"□

env.deploy_full_path□

    if result.failed and no□"put file failed□
Continue[Y/N]□"□□

        abort□"Aborting file put task□"□

    with cd□env.deploy_full_path□□    #□□□□□□□□□□

        run□"tar -zxvf %s.tar.gz" %
□env.project_pack_name□□

        run□"rm -rf %s.tar.gz" % □env.project_pack_name□□

    print green□"Put & untar package success□"□

@task

def make_symlink□□□    #□□□□□□□□□□□

    print yellow□"update current symlink"□

    env.deploy_full_path=env.deploy_project_root +
env.deploy_release_dir +

"/"+env.deploy_version

    with settings□warn_only=True□□    #□□□□□□□□□□□□□□□□□□□□
□□□□

        run□"rm -rf %s" % □env.deploy_project_root +
env.deploy_current_dir□□

        run□"ln -s %s %s" % □env.deploy_full_path□
env.deploy_project_root +
env.deploy_current_dir□□

    print green□"make symlink success□"□

@task

def rollback□□□    #□□□□□□□□

    print yellow□"rollback project version"□

    versionid= input_versionid□□    #□□□□□□□□□□□□

    if versionid==''□

        abort□"Project version ID error□abort□"□

    env.deploy_full_path=env.deploy_project_root +
env.deploy_release_dir +

"/"+versionid

    run□"rm -f %s" % env.deploy_project_root +
env.deploy_current_dir□

    run□"ln -s %s %s" % □env.deploy_full_path□
env.deploy_project_root + env.

deploy_current_dir□□    #□□□□□□□□□□□□□□□□□□□□□□□□

    print green□"rollback success□"□

@task

def go□□□    #□□□□□□□□□□□□□

    tar_source□□

    put_package□□

    make_symlink□□
```

[illegible]current[illegible]7-5[illegible]



[illegible]7-5 [illegible]

[illegible]Nginx[illegible]

```
server_name domain.com

index index.html index.htm index.php[illegible]

root /data/www/Lwebadmin/current[illegible]
```

[illegible]“/data/www/Lwebadmin/current”[illegible]Linux[illegible]

□□□□ 7.2□fab□□□□□□□□
http://docs.fabfile.org/en/1.8/□□□□□

[illegible]8[illegible] [illegible]“[illegible]”[illegible]WebServer

[illegible]Web[illegible]HTTP[illegible]Web[illegible]HTTP[illegible]HTTP[illegible]WebServer——Yorserver[illegible]WebServer[illegible]

8.1 Yorserver[illegible]

8.1.1 [illegible]

Yorserver[illegible]Python[illegible]WebServer[illegible]WebServer[illegible]Linux i386[illegible]x86[illegible]Yorserver[illegible]1.0.1[illegible]

·[illegible]response[illegible]

·[illegible]Expires[illegible]max-age[illegible]

·[illegible]

·[illegible]

·[illegible]access_log[illegible]error_log[illegible]

·[illegible]gzip[illegible]

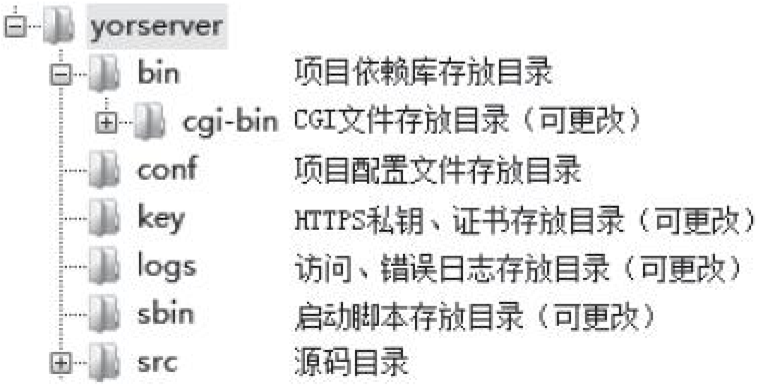
·[illegible]HTTPS[illegible]

·[illegible]HTTP MIME[illegible]

·[illegible]PHP[illegible]Perl[illegible]Python[illegible]cgi[illegible]

·[illegible]

Yorserver□□□□□□□□□□□□□8-1□□□“□□□”□□□□□□□□□□□□□□□□□□cgi-bin□□CGI□□□□□□□□□□□□□□□□□chmod+x index.pl□



yorserver
bin 项目依赖库存放目录
cgi-bin CGI文件存放目录（可更改）
conf 项目配置文件存放目录
key HTTPS私钥、证书存放目录（可更改）
logs 访问、错误日志存放目录（可更改）
sbin 启动脚本存放目录（可更改）
src 源码目录

□8-1　Yorserver□□□□

□□□sbin/server.sh start□□□Yorserver□□□

8.1.2　□□□□

Yorserver□□ConfigObj□□□□□□□ConfigObj□□□□□□□□□□□□□□□□□□Python□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Yorserver□□□□□□□□□□□□

□/usr/local/yorserver/conf/yorserver.conf□

```
# server_version□ Add response HTTP header server version
information.

server_version = "YorServer1.0"

# bind_ip□ Allows you to bind yorserver to specific IP
addresses.
```

```
bind_ip="0.0.0.0"

# port Allows you to bind yorserver's port http default
80 and Https 443.

port=80

# sys_version Add response HTTP header python version
information.

sys_version = ""

# protocol_version Add response HTTP header protocol
version.

protocol_version = "HTTP/1.0"

# Expires Add response HTTP header Expires and Max-age
version. formatd/h/m.

Expires="7d"

# Multiprocess configure yorserver Multi process support
on/off.

Multiprocess="off"

# Multithreading configure yorserver Multi threading
supporton/off.

Multithreading="on"

# DocumentRoot configure web server document root.

DocumentRoot="/usr/local/yorserver/www"

# page404 configure web server deafult 404 page.

page404="/404.html"

# Indexes directory list on/off.

Indexes="off"
```

```
# indexpage□ configure web server deafult index page.

indexpage="/index.html"

# Logfile□ configure web server log file path□disable logs
Logfile="".

Logfile="/usr/local/yorserver/logs/access.log"

# errorfile□ configure web server error file path.

errorfile="/usr/local/yorserver/logs/error.log"

[gzip]

# gzip□ Enable□on□ or Disable□off□ gzip options.

gzip="on"

# configure compress level□1~9□

compresslevel=1

[ssl]

# ssl□ Enable□on□ or Disable□off□ HTTPS options□port
options must configure "443".

ssl="off"

# configure privatekey and certificate pem.

privatekey="/usr/local/yorserver/key/server.key"

certificate="/usr/local/yorserver/key/server.crt"

[cgim]

# cgi_moudle□ Enable□on□ or Disable□off□ cgi support.

cgi_moudle="on"

# cgi_path□ configure cgi path□multiple cgi path use '□'
delimited□cgi_path in bin directory.
```

```
cgi_path='/cgi-bin'□
# cgi_extensions□ configure cgi file extension.
cgi_extensions="□'.cgi'□'.py'□'.pl'□'.php'□"
# contentTypes□ configure file mime support.
[contentTypes]
css="text/css"
doc="application/msword"
gif="image/gif"
gz="application/x-gzip"
… …
```

□□Nginx□Apahce□□□□□Yorserver□□□□□□□□□□□□□□□□□□□□□□□□□□□□Web□□□□□□□□□□□□□□□□□□□□□HttpWatch□□□□□□□□□□Yorserver□□□□□□□□□□□□□□□□

8.2 [illegible]

Python[illegible]HTTP[illegible]BaseHTTPServer[illegible]Web[illegible]SimpleHTTPServer[illegible]GET[illegible]HEAD[illegible]CGIHTTPServer[illegible]POST[illegible]Yorserver[illegible]BaseHTTPServer[illegible]Web[illegible]HTTPServer[illegible]CGIHTTPServer[illegible]CGI[illegible]

8.2.1 HTTP[illegible]

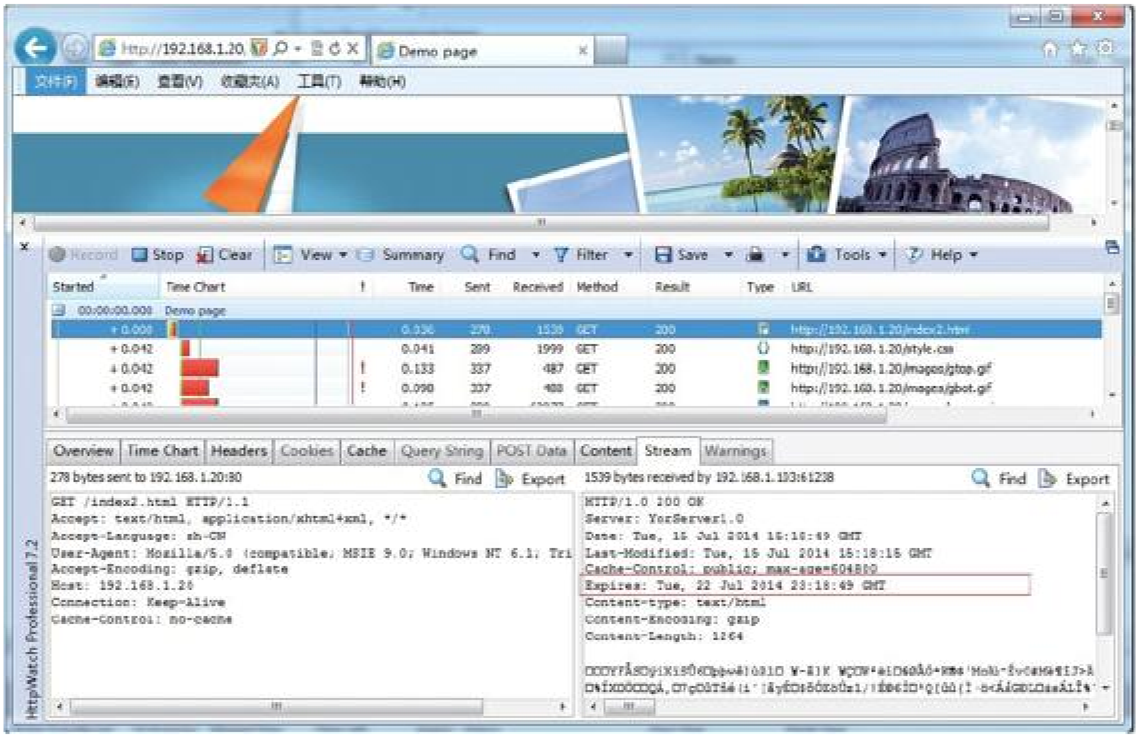
[illegible]1[illegible]Expires[illegible]

[illegible]HTTP/1.1[illegible]Expires[illegible]URL[illegible]Yorserver[illegible]Expires[illegible]“Expires="7d"”[illegible]7[illegible]

```
# Expires[illegible] Add response HTTP header Expires and Max-age
version. format[illegible]d/h/m[illegible]day/hour/minute[illegible].

Expires="7d"
```

[illegible]Yorserver[illegible]URL“http://192.168.1.20/index2.html”[illegible]HttpWatch[illegible]8-2[illegible]Expires[illegible]“Tue[illegible]22 Jul 2014 23[illegible]18[illegible]49 GMT”[illegible]

□□□□Date□□□“Tue□15 Jul 2014 15□18□49 GMT”□□□Date□□□□□□□□□□□□□□□□□□□□□“+8”□□“Tue□15 Jul 2014 23□18□49”□□□□□□7□□7d□□□□□□□□□Expires□□□□


```
GET /index2.html HTTP/1.1
Accept: text/html, application/xhtml+xml, */*
Accept-Language: zh-CN
User-Agent: Mozilla/5.0 (compatible; MSIE 9.0; Windows NT 6.1; Tri
Accept-Encoding: gzip, deflate
Host: 192.168.1.20
Connection: Keep-Alive
Cache-Control: no-cache
```

```
HTTP/1.0 200 OK
Server: YorServer1.0
Date: Tue, 15 Jul 2014 15:18:49 GMT
Last-Modified: Tue, 15 Jul 2014 15:18:15 GMT
Cache-Control: public; max-age=604800
Expires: Tue, 22 Jul 2014 23:18:49 GMT
Content-type: text/html
Content-Encoding: gzip
Content-Length: 1264
```

图8-2 □□□Expires□□□□

□□Yorserver□□□□□□Expires□□□□□□□□□□□“□□□□”+“□□□□□□”□“□□□□”□□□datetime.timedelta□□□□□□□□□□□□□□□□“□□□□”□□□“□□□□”□□□days□□□□hours□□□□□minutes□□□□□□□□□□□□□□Yorserver□□□□Expires□□□□□□

```
#□□□□Expires□□□□

def get_http_expiry□_Expirestype□_num□□

    if _Expirestype=="d"□    #□□□□+□□□□□□□□□□□□□□

        expire_date = datetime.datetime.now□□ +
datetime.timedelta□days=_num□

    elif _Expirestype=="h"□

        expire_date = datetime.datetime.now□□ +
datetime.timedelta□hours=_num□

    else□

        expire_date = datetime.datetime.now□□ +
datetime.timedelta□minutes=_num□

    return expire_date.strftime□'%a□ %d %b %Y %H□%M□%S
GMT'□    #□□□□□□
```

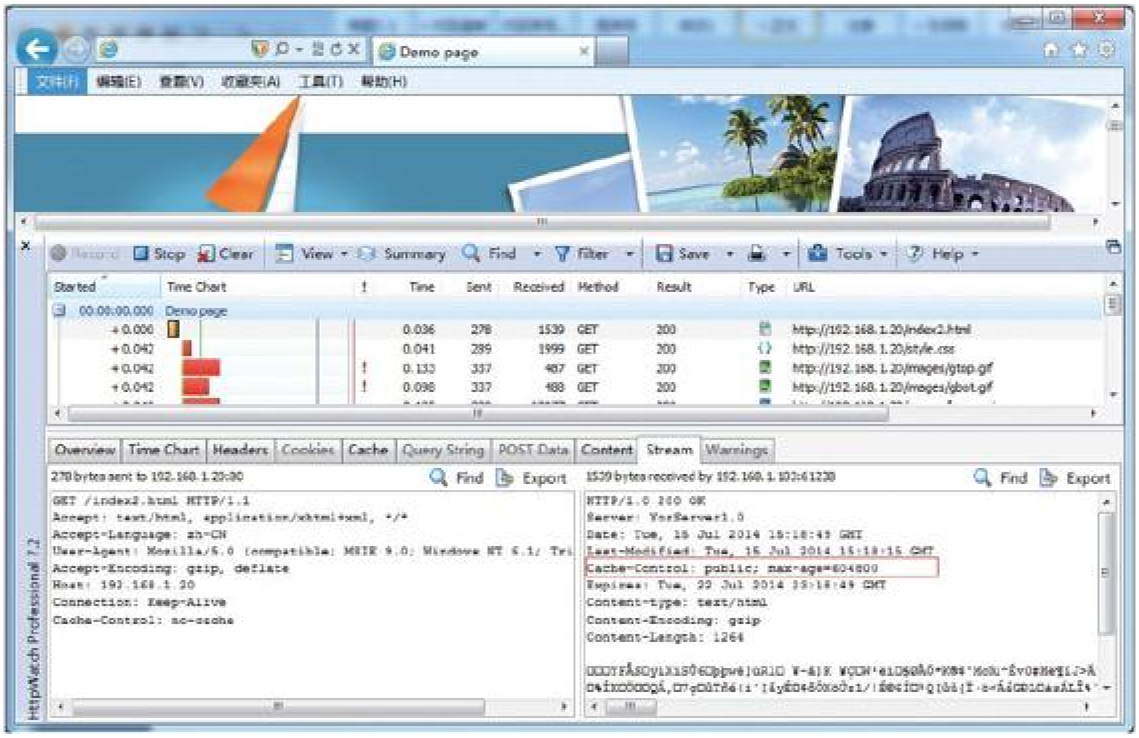
# Expires□□

□2□max-age□□

□□□□□□□□□□□□□HTTP□□□□□“cache-control”□□□□□□max-age□□□□□□□□□□□□□max-age□□Expires□□□max-age□□□□□□□□□□□□□□□□□□□□□Expires□□□□□□max-age□□□Expires□□□□□□□max-age□□□□□□□□max-age□Expires□□□Yorserver□□□□□Expires□□□□max-age□□□□□□□□

```
#□□□□□□□□□□□□“□”□□

ExpiresTypes = {

    "d"    □ 86400□

    "h"    □ 3600□

    "m"    □ 60□

}

#□□max-age□□□□□□□□□□□□*□□□□

def secs_from_days□_seconds□_num□□

    return _seconds * _num

#□□“cache_control”□□□□

Expirestype="d"

Expirenum=7

CACHE_MAX_AGE=pubutil.secs_from_days
□ExpiresTypes[Expirestype]□int□Expirenum□□

cache_control = 'public□ max-age=%d' % □CACHE_MAX_AGE□ □
```

□□□□□“7d”□□□□□□□□“86400*7=604800”□□□□□“Cache-Control”□□□“Cache-Control□public□max-age=604800”□□□□□8-3□□□



```
Started          Time Chart   !  Time   Sent  Received  Method  Result  Type  URL
00:00:00.000     Demo page
+0.000                           0.036  278   1539      GET     200           http://192.168.1.20/index2.html
+0.042                           0.041  289   1999      GET     200           http://192.168.1.20/style.css
+0.042                        !  0.133  337   487       GET     200           http://192.168.1.20/images/gtop.gif
+0.042                        !  0.098  337   488       GET     200           http://192.168.1.20/images/gbot.gif
```

278 bytes sent to 192.168.1.20:80

```
GET /index2.html HTTP/1.1
Accept: text/html, application/xhtml+xml, */*
Accept-Language: zh-CN
User-Agent: Mozilla/5.0 (compatible; MSIE 9.0; Windows NT 6.1; Tri
Accept-Encoding: gzip, deflate
Host: 192.168.1.20
Connection: Keep-Alive
Cache-Control: no-cache
```

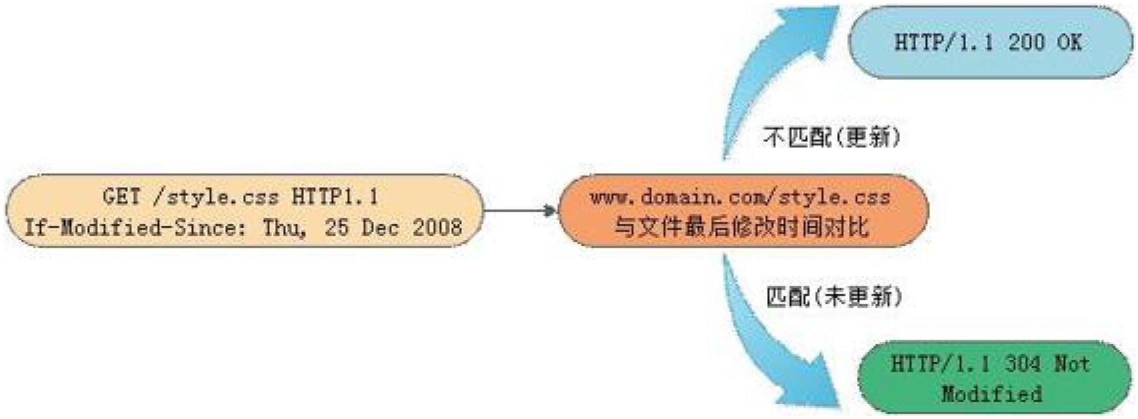
1539 bytes received by 192.168.1.103:61230

```
HTTP/1.0 200 OK
Server: YorServer1.0
Date: Tue, 15 Jul 2014 15:18:49 GMT
Last-Modified: Tue, 15 Jul 2014 15:18:15 GMT
Cache-Control: public; max-age=604800
Expires: Tue, 22 Jul 2014 15:18:49 GMT
Content-type: text/html
Content-Encoding: gzip
Content-Length: 1264
```

□8-3　□□max-age□□□□

□3□Last-Modified□□

□□□□□□□□□□□Last-Modified□□□□□□□□□□If-Modified-Since□□□□□□□□□□□□□□□□Last-Modified□□□HTTP 200□□□□□□□□□□□□HTTP 304□□8-4□□□

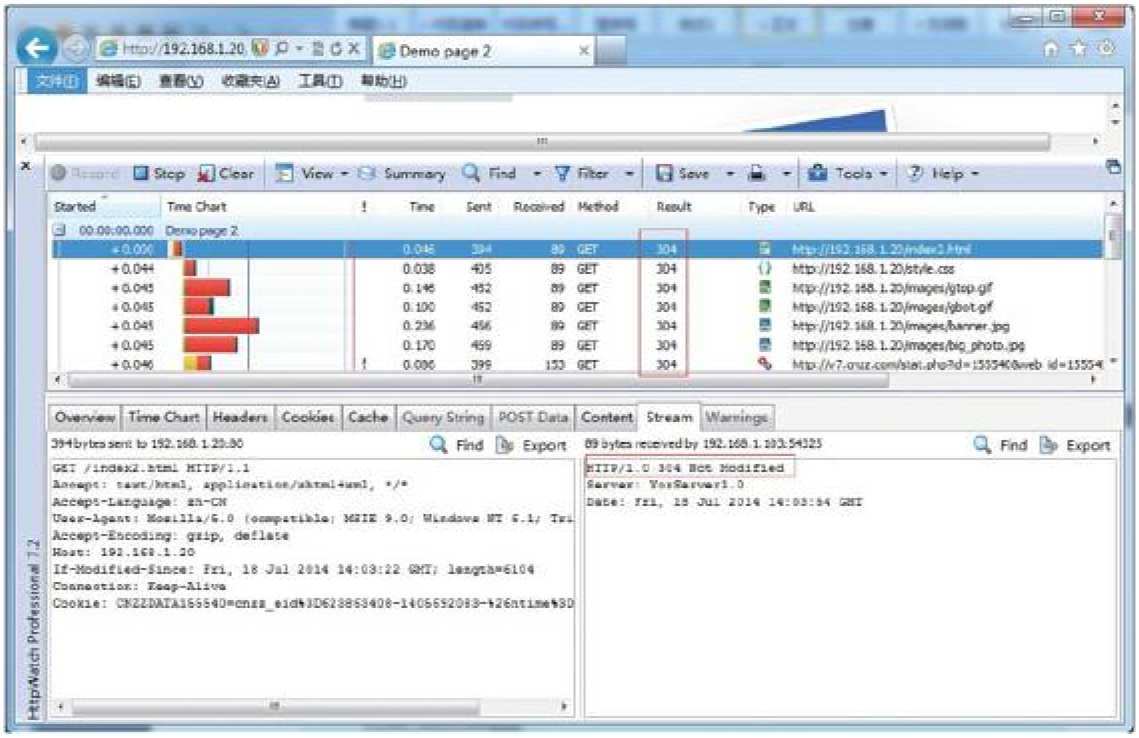


□8-4   Last-Modified□□□□□

Yorserver□□Last-Modified□□□□□□□□□□□□□□□□□□Pragma□Cache-Control□□□□□□□□□□no-cache□□□□□□□□□□□□□□□□□□□□□□□□□□□“Ctrl+F5”□□□□□□□HTTP 200□□□□□□□□□□□If-Modified-Since□□□□□□□□□mtime□□□□□□□□□□□□□□□□□□□□□□□□□□□□“HTTP/1.0 304 Not Modified”□□□□□□□“HTTP 200”□□□□□□□□

```
client_cache_cc = self.headers.getheader□'Cache-Control'□
#□□□□□Cache-Control□

client_cache_p = self.headers.getheader□'Pragma'□   #□□□□□
Pragma□

#□□□□□If-Modified-Since□□□□□□□□□□□mtime□□□□

Modified_Since= self.headers.getheader□'If-Modified-Since'□

#□□□□□□□□□□□□□□□HTTP 200□□□□□□□If-Modified-Since□

if client_cache_cc=='no-cache' or client_cache_p=='no-
cache' or \
  □client_cache_cc==None and client_cache_p==None and
Modified_Since==None□□

    client_modified=None

else□

    try□    #□□□□□□□□□□□□

        client_modified = Modified_Since.split□'□'□[0]

    except□

        client_modified=None

#□□□mtime□□□□□□Last-Modified□□□□“Mon□ 29 Dec 2008 16□51□22
GMT”

file_last_modified=self.date_time_string□fs.st_mtime□

if client_modified==file_last_modified□    #□□If-Modified-
Since□□□mtime□

    self.send_response□304□    #□□□□□304□□

    self.end_headers□□

else□

    self.send_response□200□    #□□□□□□200□□

    #□□□mtime□□Last-Modified□□

    self.send_header□'Last-Modified'□ file_last_modified□

    self.send_header□'Cache-Control'□ cache_control□

    self.send_header□'Expires'□ expiration□

    self.send_header□'Content-type'□content_type□
```

□□□□□□□□□□□□□□8-5□□□□□□□□□□□□□□□□□“HTTP/1.0 304 Not Modified”□□□□□□□□□□□□□□□□mtime□□□□□□□□□□“HTTP 200”□□□



Started	Time Chart	!	Time	Sent	Received	Method	Result	Type	URL
00:00:00.000	Demo page 2								
+0.000			0.046	394	89	GET	304		http://192.168.1.20/index2.html
+0.044			0.038	405	89	GET	304		http://192.168.1.20/style.css
+0.045			0.146	452	89	GET	304		http://192.168.1.20/images/gtop.gif
+0.045			0.100	452	89	GET	304		http://192.168.1.20/images/gbot.gif
+0.045			0.236	456	89	GET	304		http://192.168.1.20/images/banner.jpg
+0.045			0.170	459	89	GET	304		http://192.168.1.20/images/big_photo.jpg
+0.046		!	0.086	399	153	GET	304		http://v7.cnzz.com/stat.php?id=155540&web_id=15554

394 bytes sent to 192.168.1.20:80

```
GET /index2.html HTTP/1.1
Accept: text/html, application/xhtml+xml, */*
Accept-Language: zh-CN
User-Agent: Mozilla/5.0 (compatible; MSIE 9.0; Windows NT 6.1; Tri
Accept-Encoding: gzip, deflate
Host: 192.168.1.20
If-Modified-Since: Fri, 18 Jul 2014 14:03:22 GMT; length=6104
Connection: Keep-Alive
Cookie: CNZZDATA155540=cnzz_eid%3D623853408-1405692083-%26ntime%3D
```

89 bytes received by 192.168.1.103:54325

```
HTTP/1.0 304 Not Modified
Server: YorServer1.0
Date: Fri, 18 Jul 2014 14:03:54 GMT
```

□8-5　□□304□□□□

8.2.2　HTTP□□□□

□□HTTP□□Yorserver□□□□□□gzip□□□□□□□□□□□□□□□□□□□□gzip□□CPU□□□□□□□□□□□□□□□□□□□□□□□□html□css□js□□□□□□□□□□□□Yorserver□□□□□□□□□□□compresslevel□□□□□

□□□1~9□“1”□□□□□□□□□□□□“9”□□□□□□□□□□□□□□□CPU□□□

```
[gzip]

# gzip□ Enable□on□ or Disable□off□ gzip options.

gzip="on"

# configure compress level□1~9□

compresslevel=9
```

□□□□HTTP□□□□□□□□□□□□gzip□cStringIO□□□□□gzip□□□□□□□□□□cStringIO□□

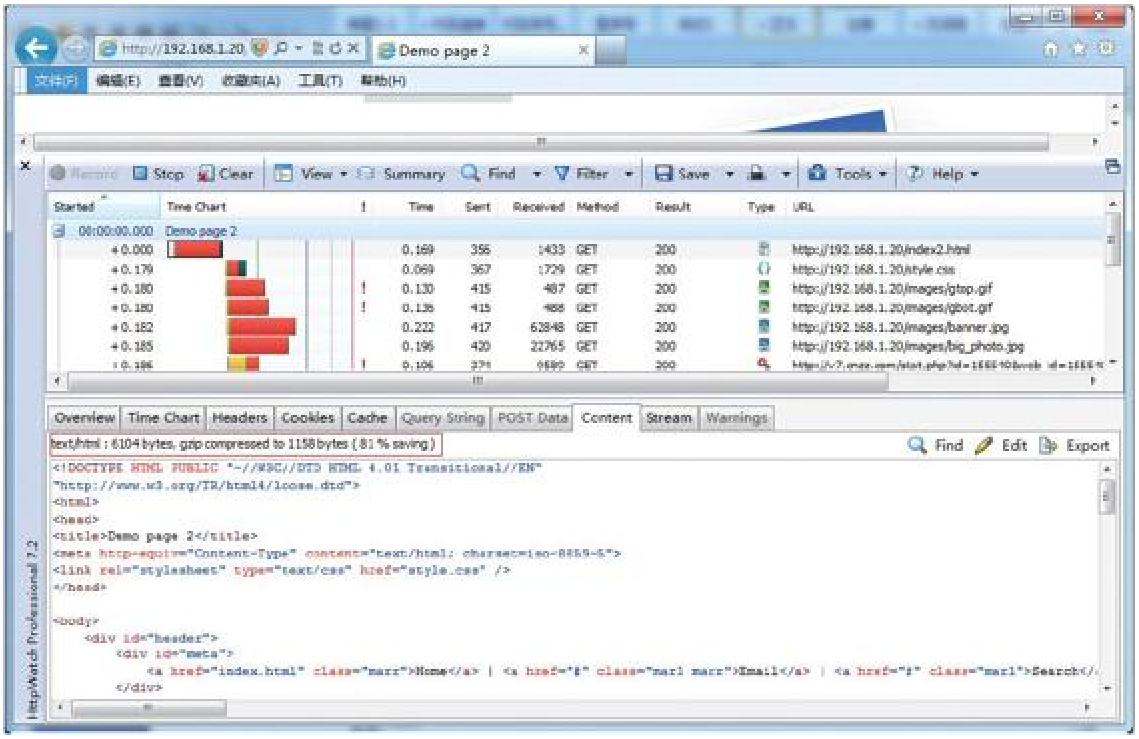
```
#HTTP□□□□□□□□□buf□□□□□□_compresslevel□□□□

def compressBuf□buf□_compresslevel□□

    import gzip□ cStringIO

    zbuf = cStringIO.StringIO□□    #□□□□□□□□□□□

    #□□□□gzip□□□□

    zfile = gzip.GzipFile□mode = 'wb'□  fileobj = zbuf□
compresslevel = _compresslevel□

    zfile.write□buf□    #□□□□□□□□

    zfile.close□□

    return zbuf.getvalue□□    #□□□□□□
```

```
f = open□DocumentRoot + sep + self.path□

if gzip=="on"□    #□□gzip□□□□□□□□□compressBuf□□□□□□□□□□□□□

    compressed_content =compressBuf□f.read□□□compresslevel□

else□

    compressed_content = f.read□□
```

HTTP□□□□□□□□8-6□□□index2.html□□□□□□□6104□□□gzip□□□□1158□□□□□□□81%□□□□□□□□□□

8.2.3 HTTP SSL□□

HTTPS□Hyper Text Transfer Protocol over Secure Socket Layer□□□□□□□□□HTTP□□□□□□□□HTTP□□□□□□HTTP□□□□□SSL□□HTTPS□□□□□□SSL□□□□□□□□□□□□□SSL□Secure Sockets Layer□□□□□□□□□□HTTPS□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□



```
Started          Time Chart  !   Time   Sent  Received  Method  Result  Type  URL
00:00:00.000     Demo page 2
   +0.000                        0.169  356   1433      GET     200           http://192.168.1.20/index2.html
   +0.179                        0.069  367   1729      GET     200           http://192.168.1.20/style.css
   +0.180                    !   0.130  415    487      GET     200           http://192.168.1.20/images/gtop.gif
   +0.180                    !   0.136  415    488      GET     200           http://192.168.1.20/images/gbot.gif
   +0.182                        0.222  417   62848     GET     200           http://192.168.1.20/images/banner.jpg
   +0.185                        0.196  420   22765     GET     200           http://192.168.1.20/images/big_photo.jpg
```

text/html : 6104 bytes, gzip compressed to 1158 bytes (81 % saving)

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<title>Demo page 2</title>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-5">
<link rel="stylesheet" type="text/css" href="style.css" />
</head>

<body>
    <div id="header">
        <div id="meta">
            <a href="index.html" class="marr">Home</a> | <a href="#" class="marl marr">Email</a> | <a href="#" class="marl">Search</
        </div>
```

□8-6　HTTP□□□□□

□□Yorserver□□SSL□□□□□□□□□□□□□443□□□□SSL□□□□□□□□privatekey□□□certificate□□□□□□□□□□□□

```
# port□ Allows you to bind yorserver's port□ http default
80 and Https 443.

port=443

[ssl]

# ssl□ Enable□on□ or Disable□off□ HTTPS options□port
options must configure "443".

ssl="on"

# configure privatekey and certificate pem.
```

```
privatekey="/usr/local/yorserver/key/app.key"

certificate="/usr/local/yorserver/key/server.crt"
```

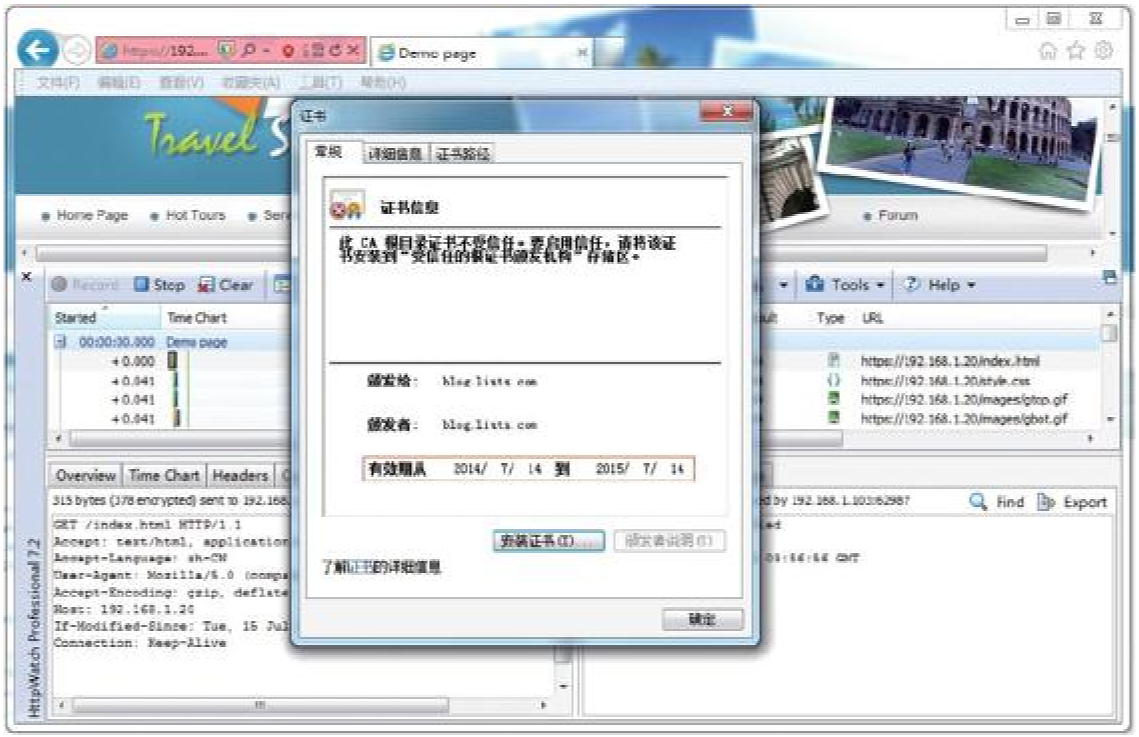
□□□□□□□□□□OpenSSL□SocketServer□□□□□□□OpenSSL□□SSL□□□□SocketServer□□□□□□□□□□□□□□

```
class SecureHTTPServer□HTTPServer□□

    def __init__□self□ server_address□ HandlerClass□□

        BaseServer.__init__□self□ server_address□
HandlerClass□

        ctx = SSL.Context□SSL.SSLv23_METHOD□    #□□□□SSL□□

        ctx.use_privatekey_file□privatekey□    #□□□□□□

        ctx.use_certificate_file□certificate□    #□□□□□□

        self.socket = SSL.Connection□ctx□ socket.socket
□self.address_family□\

self.socket_type□□    #□□□□□□□□□□□□□□□□OpenSSL.SSL.Context□
□□Socket

        self.server_bind□□    #□□□□□□□

        self.server_activate□□
```

□□□□□□□□□□□□□□□□

```
# □□RSA□□server.key

# openssl genrsa -des3 -out server.key 1024
# □□□□□□□□app.key□□□□□□□□

# openssl rsa -in server.key -out app.key

# □□□□□□□□server.csr

# openssl req -new -key server.key -out server.csr

# □□□□server.crt

# openssl x509 -req -days 365 -in server.csr -signkey
server.key -out server.crt
```

□□□□□□□□□□□app.key□□□□□server.crt□□□yorserver.conf□□□□□□□□□□/usr/local/yorserver/key/app.key□/usr/local/yorserver/key/server.crt□□□□□Yorserver□□□□□□□8-7□□□


证书

常规 详细信息 证书路径

证书信息

此 CA 根目录证书不受信任。要启用信任，请将该证书安装到"受信任的根证书颁发机构"存储区。

颁发给： blog.lists.com

颁发者： blog.lists.com

有效期从 2014/ 7/ 14 到 2015/ 7/ 14

安装证书(I)... 颁发者说明(S)

了解证书的详细信息

确定

315 bytes (378 encrypted) sent to 192.168

```
GET /index.html HTTP/1.1
Accept: text/html, application
Accept-Language: zh-CN
User-Agent: Mozilla/5.0 (compa
Accept-Encoding: gzip, deflate
Host: 192.168.1.20
If-Modified-Since: Tue, 15 Jul
Connection: Keep-Alive
```

https://192...
Demo page
文件(F) 编辑(E) 查看(V) 收藏夹(A) 工具(T) 帮助(H)
Home Page
Hot Tours
Forum
Record
Stop
Clear
Tools
Help
Started
Time Chart
Type
URL
00:00:30.000
Demo page
+0.000
+0.041
+0.041
+0.041
https://192.168.1.20/index.html
https://192.168.1.20/style.css
https://192.168.1.20/images/gtop.gif
https://192.168.1.20/images/gbot.gif
Overview
Time Chart
Headers
Find
Export
HttpWatch Professional 7.2

□8-7　SSL□□□□

8.2.4　□□□□□□

Web□□□Yorserver□□□□□□□□□□□□□□□/□□□□□□□□

```
# Indexes□ directory list □on/off□.

Indexes="on"
```

□□□□□□□□os.listdir□□□□□□□□□□□□□□□□□□□□□□□□□“<li>”□“<a>”HTML□□□□□□□□□□□□□□□□□

```
def list_directory□self□ path□□

    try□

        list = os.listdir□path□    #□□□□□□□□□□□□□□

    except os.error□

        self.send_error□404□ "No permission to list
directory"□□

        return None

    list.sort□lambda a□ b□ cmp□a.lower□□□ b.lower□□□□    #□
□□□□□□□□□□□□□

    f = StringIO□□    #□□□□□□□□

    f.write□"<h2>Directory listing for %s</h2>\n" %
```

```
self.path□ #self.path□□□URL□□
    f.write□"<hr>\n<ul>\n"□
    #□□□□□□□URL□□
    f.write□'<li><a href="%s">Parent Directory</a>\n' % □pubutil.parent_dir□self.path□□□
    for name in list□    #□□□□□□□□□□
        fullname = os.path.join□path□ name□
        displayname = name = cgi.escape□name□    #HTML□□□□
        if os.path.islink□fullname□□
            displayname = name + "@"
        elif os.path.isdir□fullname□□
            displayname = name + "/"
            name = name + os.sep
        f.write□'<li><a href="%s">%s</a>\n' % □name□ displayname□□
    f.write□"</ul>\n<hr>\n"□
    f.seek□0□
    return f
```

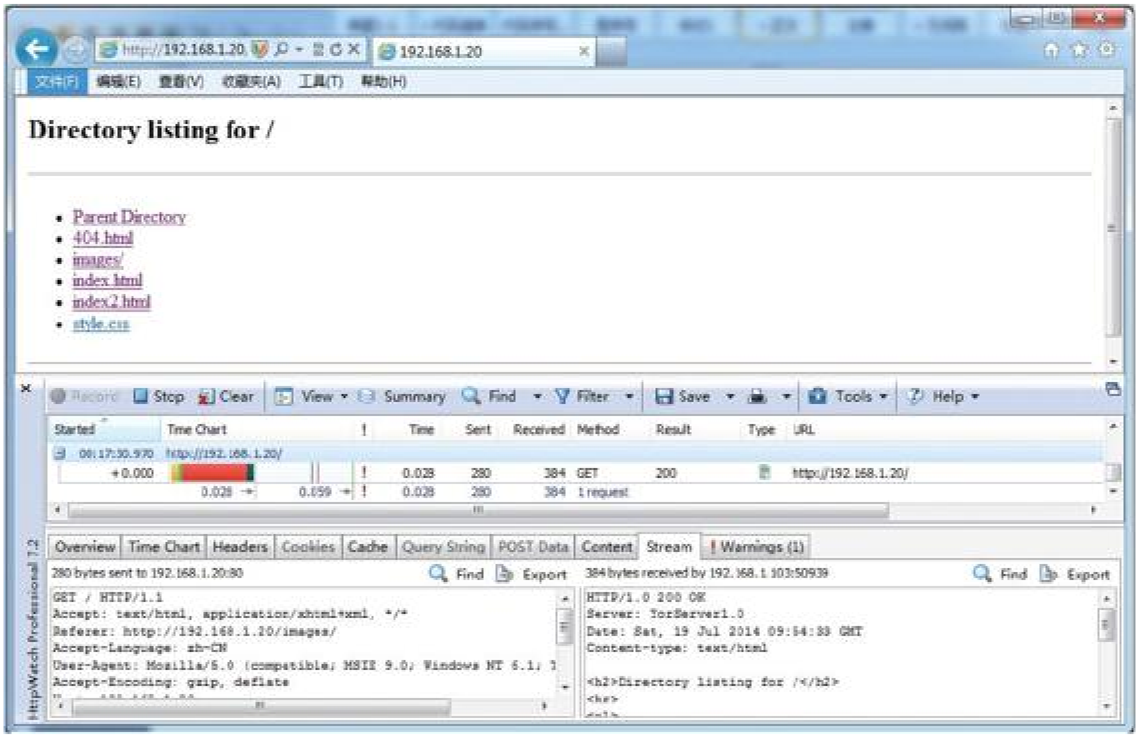
□□□□□□□□8-8□□□

8.2.5 □□CGI□□

CGI□Common Gateway Interface□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□CGI□□

□□□□□□□□□□□□□□□□□□□□□□□□CGI□□□□□□Shell□Perl□Python□Ruby□PHP□TCL□C/C++□□Yorserver□□□□CGI□□□□□□□□□□□□□□□cgi_path□□□□CGI□□□□□□□□□□□yorserver/bin/cgi-bin□□□□□□□□□□□□“□”□□□□cgi_extensions□□□□CGI□□□□□□□□□□□□□□□□□

```
[cgim]

# cgi_moudle□ Enable□on□ or Disable□off□ cgi support.

cgi_moudle="on"

# cgi_path□ configure cgi path□multiple cgi path use '□'
delimited□cgi_path in bin directory.

cgi_path='/cgi-bin'□

# cgi_extensions□ configure cgi file extension.

cgi_extensions="□'.cgi'□'.py'□'.pl'□'.php'□"
```


http://192.168.1.20
192.168.1.20
文件(F) 编辑(E) 查看(V) 收藏夹(A) 工具(T) 帮助(H)
Record Stop Clear View Summary Find Filter Save Tools Help
Overview Time Chart Headers Cookies Cache Query String POST Data Content Stream Warnings (1)
Find Export
HttpWatch Professional 7.2

Directory listing for /

- Parent Directory
- 404.html
- images/
- index.html
- index2.html
- style.css

```
Started       Time Chart          !  Time   Sent  Received  Method     Result  Type  URL
00:17:30.970  http://192.168.1.20/
     +0.000                       !  0.028  280   384       GET        200           http://192.168.1.20/
                 0.028    0.059   !  0.028  280   384       1 request
```

280 bytes sent to 192.168.1.20:80

```
GET / HTTP/1.1
Accept: text/html, application/xhtml+xml, */*
Referer: http://192.168.1.20/images/
Accept-Language: zh-CN
User-Agent: Mozilla/5.0 (compatible; MSIE 9.0; Windows NT 6.1; T
Accept-Encoding: gzip, deflate
```

384 bytes received by 192.168.1.103:50939

```
HTTP/1.0 200 OK
Server: YorServer1.0
Date: Sat, 19 Jul 2014 09:54:33 GMT
Content-type: text/html

<h2>Directory listing for /</h2>
<hr>
```

[illegible]8-8 [illegible]

Yorserver[illegible]CGIHTTPServer[illegible]CGI[illegible]CGIHTTPRequestHandler[illegible]SimpleHTTPRequestHandler[illegible]CGI[illegible]CGIHTTPRequestHandler[illegible]class ServerHandler[illegible]CGIHTTPRequestHandler[illegible]

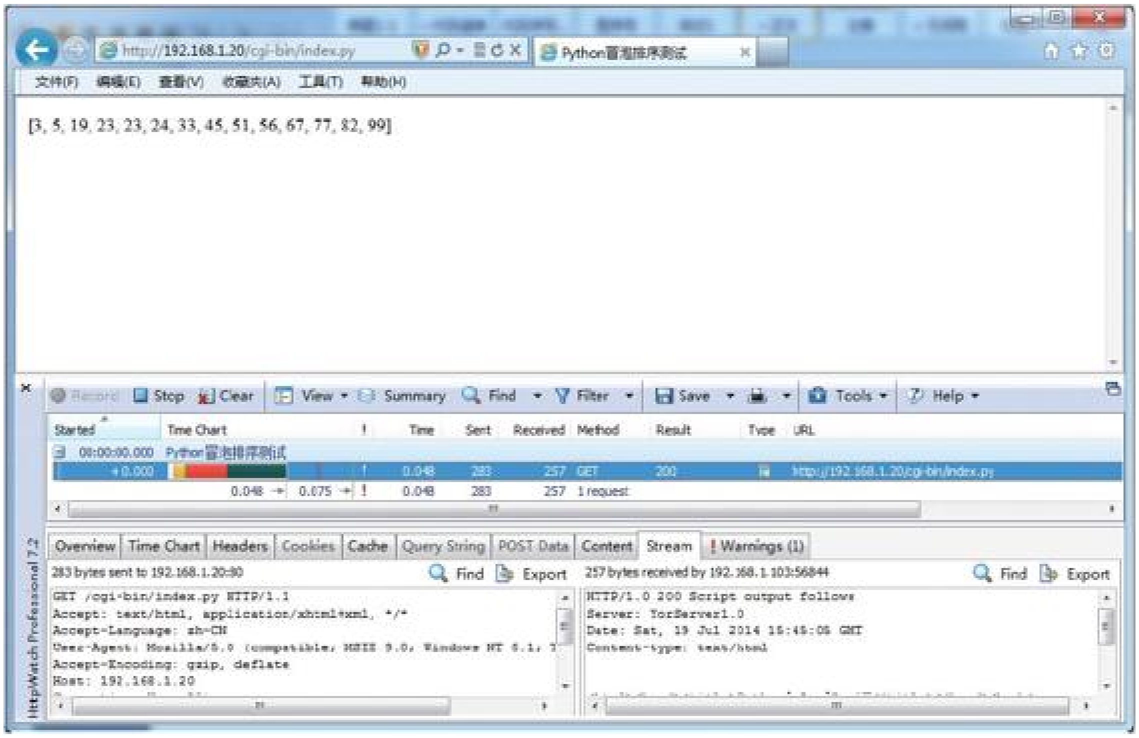
```
CGIHTTPRequestHandler.cgi_directories = cgi_path    #[illegible]CGI[illegible]
[illegible]

if cgi_moudle=="on" and self.path.endswith
[illegible]cgi_extensions[illegible]    #[illegible]CGI[illegible]

                    #[illegible]
```

```
    return CGIHTTPRequestHandler.do_GET□self□    #□□cgi
do_GET□□□□□□□□□□□□
```

□□□□Python□PHP CGI□□□□□□□□□□□□□□□□ □bin/cgi-bin/index.py□

```
#□/usr/bin/env python

#coding=utf-8

print "Content-type□ text/html\n\n"□

print "<html><head><title>Python□□□□□□</title></head>
<body>"

my_list = [23□45□67□3□56□82□24□23□5□77□19□33□51□99]

def bubble□bad_list□□

    length = len□bad_list□ - 1

    sorted = False

    while not sorted□

        sorted = True

        for i in range□length□□

            if bad_list[i] > bad_list[i+1]□

                sorted = False

                bad_list[i]□ bad_list[i+1] = bad_list[i+1]□
bad_list[i]

bubble□my_list□

print my_list
print "</body></html>"
```

□□□□□□8-9□□□



```
[3, 5, 19, 23, 23, 24, 33, 45, 51, 56, 67, 77, 82, 99]
```

Started	Time Chart	!	Time	Sent	Received	Method	Result	Type	URL
00:00:00.000	Python冒泡排序测试								
+0.000		!	0.048	283	257	GET	200		http://192.168.1.20/cgi-bin/index.py
	0.048 → 0.075 →	!	0.048	283	257	1 request			

283 bytes sent to 192.168.1.20:80

```
GET /cgi-bin/index.py HTTP/1.1
Accept: text/html, application/xhtml+xml, */*
Accept-Language: zh-CN
User-Agent: Mozilla/5.0 (compatible; MSIE 9.0; Windows NT 6.1; T
Accept-Encoding: gzip, deflate
Host: 192.168.1.20
```

257 bytes received by 192.168.1.103:56844

```
HTTP/1.0 200 Script output follows
Server: TorServer1.0
Date: Sat, 19 Jul 2014 15:45:05 GMT
Content-type: text/html
```

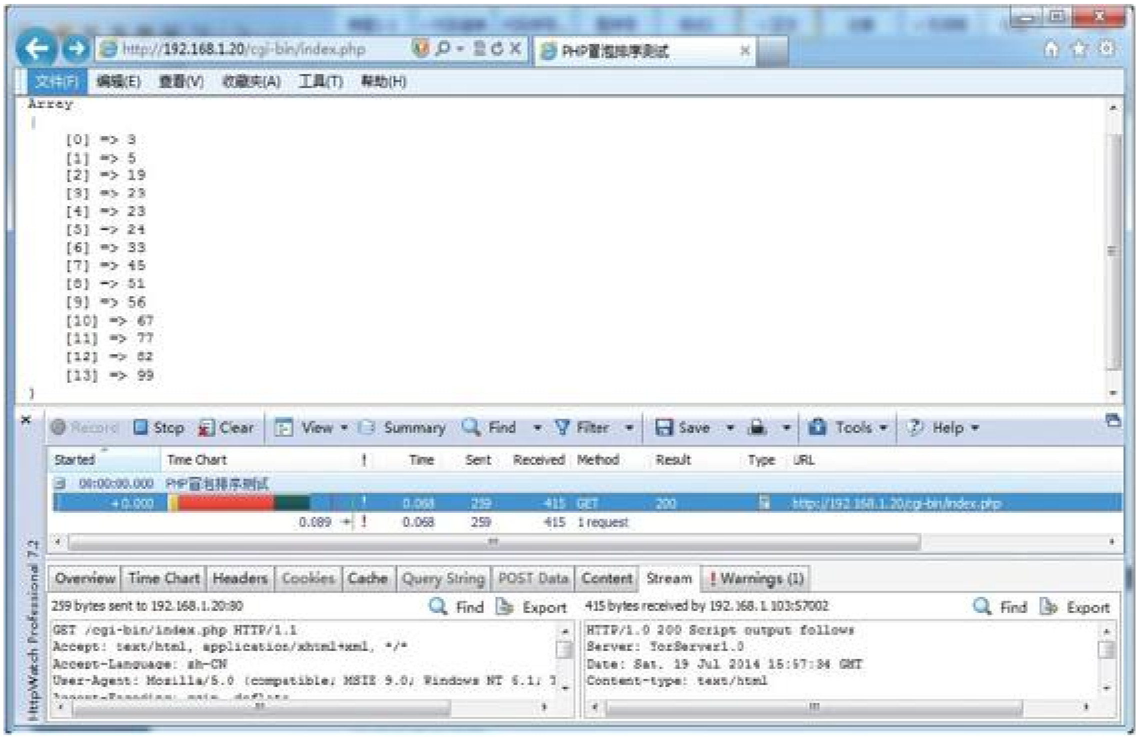
□8-9　Python CGI□□□□□

□bin/cgi-bin/index.php□

```
#□/usr/bin/env php

<□php

echo "Content-type□ text/html\n\n"□

echo "<html><head><title>PHP□□□□□□</title></head><body>
<pre>"□

function bubble□array $array□{
```

```
for□$i=0□ $len=count□$array□-1□ $i<$len□ ++$i□{
     for□$j=$len□ $j>$i□ --$j□{
         if□$array[$j] < $array[$j-1]□
         {
             $temp = $array[$j]□
             $array[$j] = $array[$j-1]□
             $array[$j-1] = $temp□
         }
     }
}
return $array□
}
print_r□bubble□array□23□45□67□3□56□82□24□23□5□77□19□33□51□99□□□□
echo "</pre></body></html>"□
□>
```

□□□□□8-10□□□



```
Array
(
    [0] => 3
    [1] => 5
    [2] => 19
    [3] => 23
    [4] => 23
    [5] => 24
    [6] => 33
    [7] => 45
    [8] => 51
    [9] => 56
    [10] => 67
    [11] => 77
    [12] => 82
    [13] => 99
)
```

Started	Time Chart	!	Time	Sent	Received	Method	Result	Type	URL
00:00:00.000	PHP冒泡排序测试								
+0.000		!	0.068	259	415	GET	200		http://192.168.1.20/cgi-bin/index.php
	0.089	!	0.068	259	415	1 request			

259 bytes sent to 192.168.1.20:80

```
GET /cgi-bin/index.php HTTP/1.1
Accept: text/html, application/xhtml+xml, */*
Accept-Language: zh-CN
User-Agent: Mozilla/5.0 (compatible; MSIE 9.0; Windows NT 6.1; T
```

415 bytes received by 192.168.1.103:57002

```
HTTP/1.0 200 Script output follows
Server: TorServer1.0
Date: Sat, 19 Jul 2014 15:57:34 GMT
Content-type: text/html
```

□8-10　PHP CGI□□□□□

[illegible]9[illegible] [illegible]Ansible[illegible]

Ansible[illegible]http://www.ansibleworks.com/[illegible]IT[illegible]AnsibleWorks[illegible]Cobbler[illegible]Func[illegible]2012[illegible]Ansible[illegible]Python[illegible]Paramiko[illegible]PyYAML[illegible]Ansible[illegible]

·[illegible]Ansible[illegible]

·[illegible]SSH[illegible]Secure SHell[illegible]

·[illegible]

·[illegible]

·[illegible]API[illegible]Python[illegible]

·[illegible]Playbooks[illegible]

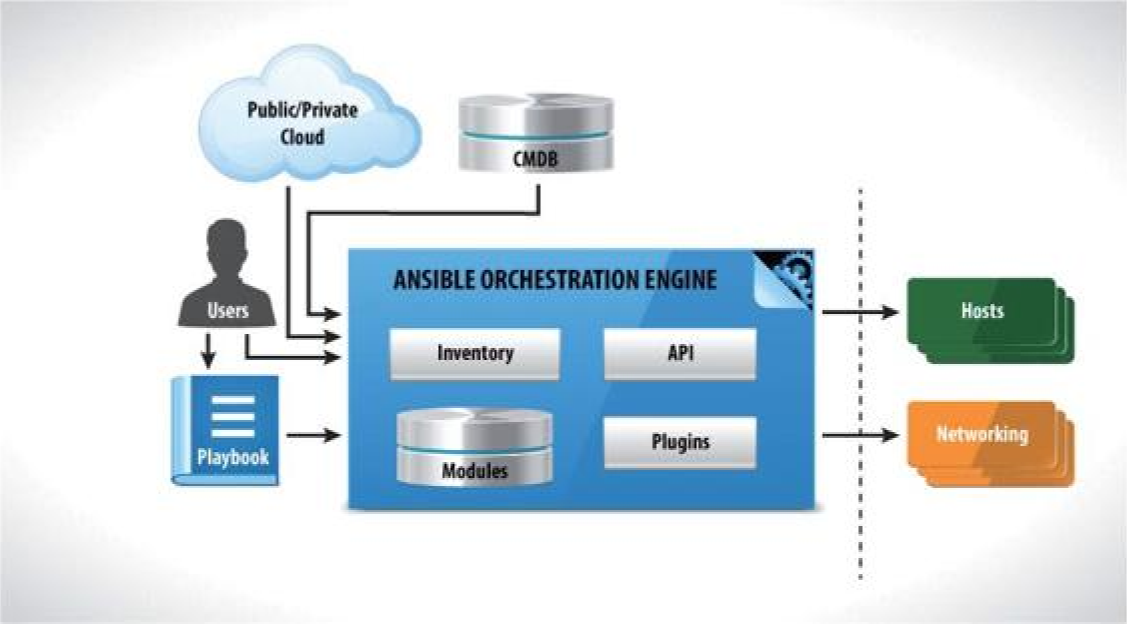
·[illegible]

·[illegible]Web[illegible]REST API[illegible]——AWX[illegible]

Ansible[illegible]9-1[illegible]Ansible[illegible]/[illegible]CMDB[illegible]Ansible[illegible]

Inventory□□□□□□□□□API□Modules□□□□□Plugins□□□□□□□

Ansible□Saltstack□□□□□□Ansible□□□□□□□□□□□□□□□□□□□□□□□SSH□□YAML□□□□□□□□□□□□□□□□□□□□API□□□□□□□□□□□□□□□□□□□Ansible□GitHub□□□□□https://github.com/ansible/□□□□□□□□□□□□□□□□□□□□□□□□1.3.2□



□9-1　Ansible□□□

□□　Ansible□□□□□□□Playbook□□□□□□□□https://galaxy.ansibleworks.com□□□□□□

□□□□□□□□□□□□□□□□□□Role□□□□□□□□□□□“ansible-galaxy install□□id.□□□□□”□□□□□□□□□□□□□□bennojoy□□□Nginx□□□□□□□□□□□□□“ansible-galaxy install bennojoy.nginx”□□□□□□□□□□□□□□□□□□https://galaxy.ansibleworks.com/list#/roles/2□

□□□□□□□□□□□□□Ansible□□□□□□□□□□□□□□□□□□□□□□□□

9.1 YAML[illegible]

YAML[illegible]Ansible[illegible]Saltstack[illegible]YAML[illegible]YAML[illegible]master[illegible]

```
file_roots[illegible]
base[illegible]
  - /srv/salt/
dev[illegible]
  - /srv/salt/dev
prod[illegible]
  - /srv/salt/prod
```

[illegible]YAML[illegible]Python[illegible]YAML[illegible]Python[illegible]List[illegible]Dictionary[illegible]

9.1.1 [illegible]

[illegible]Python[illegible]List[illegible]YAML[illegible]Python[illegible]

```
import yaml

obj=yaml.load[illegible]

"""

- Hesperiidae

- Papilionidae

- Apatelodidae

- Epiplemidae

"""[illegible]

print obj
```

[illegible]“-”[illegible]

```
['Hesperiidae'[illegible] 'Papilionidae'[illegible] 'Apatelodidae'[illegible]
'Epiplemidae']
```

YAML[illegible]Python[illegible]

```
-

- Hesperiidae

- Papilionidae

- Apatelodidae

- Epiplemidae

-
```

```
- China

- USA

- Japan
```

□□□Python□□□□

```
[['Hesperiidae'□ 'Papilionidae'□ 'Apatelodidae'□
'Epiplemidae']□ ['China'□ 'USA'□ 'Japan']]
```

9.1.2 □□□□□

□□□□□□□□□□□□□□Python□□□□Dictionary□□□□□□“□□key□□□□value□”□□□□YAML□□□

```
hero□

  hp□ 34

  sp□ 8

  level□ 4

orc□

  hp□ 12

  sp□ 0

  level□ 2
```

□□□Python□□□□

```
{'hero'□ {'hp'□ 34□ 'sp'□ 8□ 'level'□ 4}□ 'orc'□ {'hp'□ 12□
'sp'□ 0□ 'level'□ 2}}
```

□□□YAML□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

```
- hero□

   hp□ 34

   sp□ 8

   level□ 4

- orc□

   hp□

    - 12

    - 30

   sp□ 0

   level□ 2
```

□□□Python□□□□

```
[{'hero'□ {'hp'□ 34□ 'sp'□ 8□ 'level'□ 4}}□ {'orc'□ {'hp'□
[12□ 30]□ 'sp'□ 0□ 'level'□ 2}}]
```

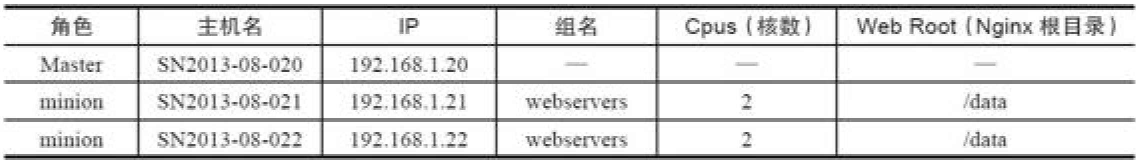
9.2 Ansible□□□

Ansible□□□□□□□□□□□□□□□□□□□yum□□□□□□□□□□□□□□□□□□

9.2.1 □□□□□□

□□CentOS release 6.4□□□Python 2.6.6□□□□□□□□□□9-1□□□CPU□□□Nginx□□□□□□□□□□□□□□□□□□□□□□□

□9-1 □□□□□



角色	主机名	IP	组名	Cpus（核数）	Web Root（Nginx 根目录）
Master	SN2013-08-020	192.168.1.20	—	—	—
minion	SN2013-08-021	192.168.1.21	webservers	2	/data
minion	SN2013-08-022	192.168.1.22	webservers	2	/data

9.2.2 □□EPEL

□□□□RHEL□□□yum□□□□□□Ansible□□□□□□□□□□□□EPEL□□□□Ansible□□□yum□□

·RHEL□CentOS□5□□□rpm-Uvh http://mirror.pnl.gov/epel/5/i386/epel-release-5-4.noarch.rpm

·RHEL□CentOS□6□□□rpm-Uvh http://ftp.linux.ncsu.edu/pub/epel/6/i386/e pel-release-6-8.noarch.rpm

9.2.3 □□Ansible

□□□□□□□□□□□□□□□□□

```
#yum install ansible -y
```

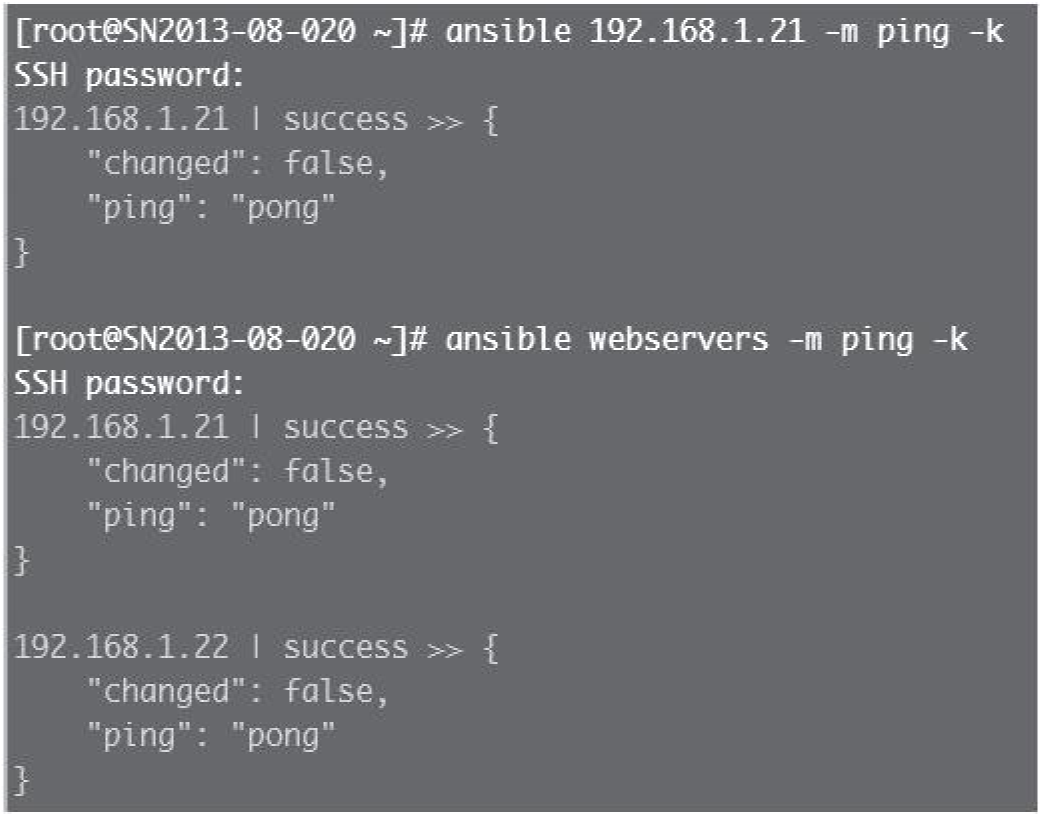
9.2.4 Ansible□□□□□

□□□□□□□□□□□□□□□□□/etc/ansible/hosts□□□□
ini□□□□□□□IP□□□□□□□IP□webservers□□□□□□
□□□□

□/etc/ansible/hosts□

```
#green.example.com

#blue.example.com

192.168.1.21

192.168.1.22

[webservers]

#alpha.example.org

#beta.example.org

192.168.1.21

192.168.1.22
```

□□ping□□□□□□□□□□□□□□□□□□□□□ping□□□□□□□9-2□□□□□□□□□□□□□□□



```
[root@SN2013-08-020 ~]# ansible 192.168.1.21 -m ping -k
SSH password:
192.168.1.21 | success >> {
    "changed": false,
    "ping": "pong"
}

[root@SN2013-08-020 ~]# ansible webservers -m ping -k
SSH password:
192.168.1.21 | success >> {
    "changed": false,
    "ping": "pong"
}

192.168.1.22 | success >> {
    "changed": false,
    "ping": "pong"
}
```

□9-2 □□□□□□□

□□ □□□□□□□□□□□□□SSH□□□□□□□□□□ansible□□□□□-k□□□□□□□root□□□□□□□□□□□□□“SSH password□”□□□□□□□□□□□□□Linux□□□□□□□□□□□□□sudo□□□□root□□□□□□□ansible webservers-m ping-u ansible-sudo□

9.2.5 □□Linux□□SSH□□□□□

[illegible]Ansible[illegible]SSH[illegible]ssh-keygen[illegible]ssh-copy-id[illegible]ssh-keygen[illegible]ssh-copy-id[illegible]

[illegible]SN2013-08-020[illegible]ssh-keygen-t rsa[illegible]/root/.ssh/[illegible]id_rsa[illegible]id_rsa.pub[illegible].ssh[illegible]authorized_keys[illegible]

```
Generating public/private rsa key pair.

Enter file in which to save the key □/root/.ssh/id_rsa□□ □□
□□

Enter passphrase □empty for no passphrase□□ □□□□

Enter same passphrase again□ □□□□

Your identification has been saved in /root/.ssh/id_rsa.

Your public key has been saved in /root/.ssh/id_rsa.pub.

The key fingerprint is□

8d□f0□47□c6□b9□55□5b□c0□0e□04□ec□e2□9c□38□f6□84
root@SN2013-08-020

The key's randomart image is□

+--[ RSA 2048]----+

|         ..o..o..|

|         ......o |
|      .  .= .o.  |
|       o.=.o  .  |
|       =So+      |
|      E =.       |
|     . +         |
|        .        |
|                 |
+-----------------+
```

□□□□□□□□□id_rsa.pub□□□□□□□□□□ssh-copy-id□□□□□□□□□□□□/usr/bin/ssh-copy-id[-i[identity_file]][user@]machine□□□□□□□□□□□□□□□□□□192.168.1.21□192.168.1.22□□□

```
#ssh-copy-id -i /root/.ssh/id_rsa.pub root@192.168.1.21
#ssh-copy-id -i /root/.ssh/id_rsa.pub root@192.168.1.22
```

□□SSH□□□□□□□□□□□□ssh root@192.168.1.21□□□□□□□□root□□□□□□□□□□□□□□

9.3 [illegible]

Ansible[illegible]Inventory[illegible]/etc/ansible/hosts[illegible]

9.3.1 [illegible]

[illegible]/etc/Ansible/hosts[illegible]ini[illegible]IP[illegible]webservers[illegible]dbservers[illegible]

```
mail.example.com

192.168.1.21[illegible]2135

[webservers]

foo.example.com

bar.example.com

192.168.1.22

[dbservers]

one.example.com

two.example.com

three.example.com

192.168.1.23
```

[illegible]192.168.1.21[illegible]2135[illegible]SSH[illegible]2135[illegible]

```
jumper ansible_ssh_port=22 ansible_ssh_host=192.168.1.50
```

jumper[illegible]ansible_ssh_port[illegible]SSH[illegible]ansible_ssh_host[illegible]

·ansible_ssh_host[illegible]

·ansible_ssh_port[illegible]SSH[illegible]22[illegible]

·ansible_ssh_user[illegible]

·ansible_ssh_pass[illegible]

·ansible_connection[illegible]local[illegible]ssh[illegible]paramiko[illegible]

·ansible_ssh_private_key_file[illegible]ssh[illegible]

·ansible_*_interpreter[illegible]Python[illegible]Ruby[illegible]Perl[illegible]ansible_python_interpreter[illegible]

[illegible]

```
[webservers]

www[01[illegible]50].example.com

[databases]

db-[a[illegible]f].example.com
```

9.3.2 [illegible]

[illegible]Playbooks[illegible]hosts1[illegible]hosts2[illegible]Apache[illegible]http_port[illegible]maxRequestsPerChild[illegible]Apache[illegible]httpd.conf[illegible]

```
[atlanta]

host1 http_port=80 maxRequestsPerChild=808

host2 http_port=303 maxRequestsPerChild=909
```

9.3.3 [illegible]

[illegible]+“[illegible]vars”[illegible]

```
[atlanta]

host1

host2
```

```
[atlanta□vars]

ntp_server=ntp.atlanta.example.com

proxy=proxy.atlanta.example.com
```

□□Ansible□□□□□□□□□□□□□□□□□□□□□+“□children”□□□□□□□□

```
[atlanta]

host1

host2

[raleigh]

host2

host3

[southeast□children]

atlanta

raleigh

[southeast□vars]

some_server=foo.southeast.example.com

halon_system_timeout=30

self_destruct_countdown=60

escape_pods=2

[usa□children]

southeast
```

```
northeast
southwest
southeast
```

□□ □□□□□□□□/usr/bin/ansible-playbook□□□/usr/bin/ansible□□□□□□

9.3.4 □□□□□□□□□□

□□□□□□□□□□□□□□□□Ansible□□□/etc/ansible/hosts□□□□□□□□□□□□□□□□□□□□□□□□□□□□□YAML□□□□□□□□□□□□“/etc/ansible/group_vars/+□□”□“/etc/ansible/host_vars/+□□□□”□□□□□□□□□□□□□□□□□□□□□

```
/etc/ansible/group_vars/dbservers
/etc/ansible/group_vars/webservers
/etc/ansible/host_vars/foosball
```

□□□dbservers□□□□□□

□/etc/ansible/group_vars/dbservers□

```
---
ntp_server□ acme.example.org
database_server□ storage.example.org
```

□□ □Ansible 1.2□□□□□□□group_vars/□host_vars/□□□□□□□playbook□□□inventory□□□□□□□□□inventory□□□□□□□□playbook□□□□

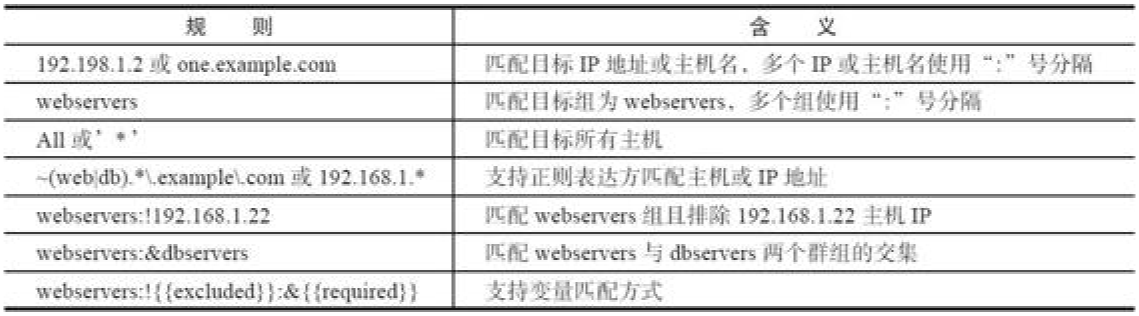
9.4 □□□□

□9.3□□□□□□□□□□□□□□□□□□□□□□□□□
□Patterns□□□□□□□□
ansible<pattern_goes_here>-m<module_name>-a<arguments>□□□□□□
□□webservers□□□□Apache□□□

```
ansible webservers -m service -a "name=httpd
state=restarted"
```

□□□□□□□<pattern_goes_here>□□□□□□□□□□
□□□□□□□9-2□

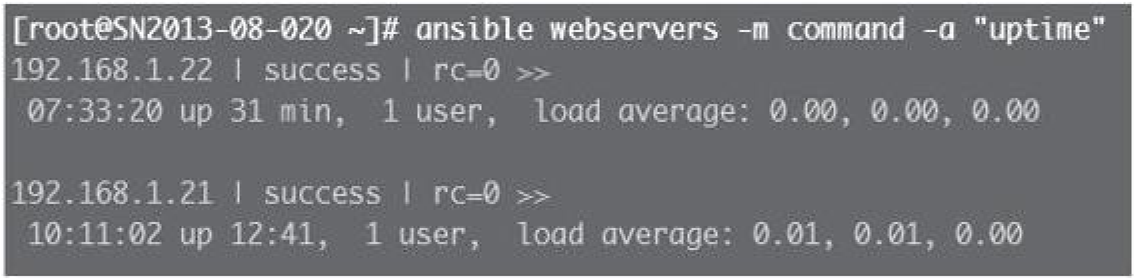
□9-2 □□□□□□□□□



规 则	含 义
192.198.1.2 或 one.example.com	匹配目标 IP 地址或主机名，多个 IP 或主机名使用 “:” 号分隔
webservers	匹配目标组为 webservers，多个组使用 “:” 号分隔
All 或’ *’	匹配目标所有主机
~(web|db).*\.example\.com 或 192.168.1.*	支持正则表达方匹配主机或 IP 地址
webservers:!192.168.1.22	匹配 webservers 组且排除 192.168.1.22 主机 IP
webservers:&dbservers	匹配 webservers 与 dbservers 两个群组的交集
webservers:!{{excluded}}:&{{required}}	支持变量匹配方式

9.5 Ansible□□□□□API

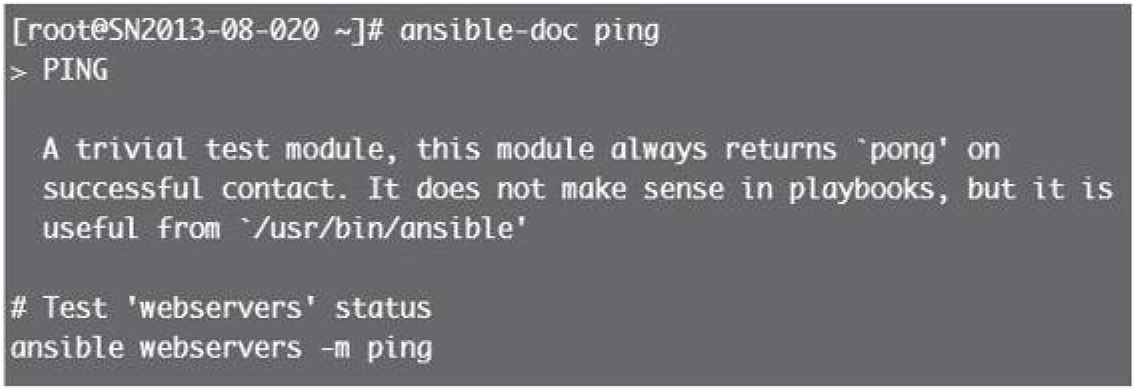
Ansible□□□□□□□□□□□□□□□Cloud□□□□□□Commands□□□□□□Database□□□□□□Files□□□□□□□Internal□□□□□□□Inventory□□□□□□□Messaging□□□□□□□Monitoring□□□□□□□Net Infrastructure□□□□□□□□□Network□□□□□□□Notification□□□□□□□Packaging□□□□□□Source Control□□□□□□□System□□□□□□□Utilities□□□□□□□Web Infrastructure□Web□□□□□□□□□□□□□□□□□□□□□□□□□http://ansibleworks.com/docs/modules.html□□□□□□□□□□□/usr/share/ansible/□□ansible<pattern_goes_here□□□□□□>-m<module_name□□□□□>-a<module_args□□□□□□>□□□□□□□□□□command□□“-m command”□□□□□□□□webservers□□□□uptime□□□□□□9-3□□□



```
[root@SN2013-08-020 ~]# ansible webservers -m command -a "uptime"
192.168.1.22 | success | rc=0 >>
 07:33:20 up 31 min,  1 user,  load average: 0.00, 0.00, 0.00

192.168.1.21 | success | rc=0 >>
 10:11:02 up 12:41,  1 user,  load average: 0.01, 0.01, 0.00
```

□9-3 □□□□“uptime”□□

□□□□□□□ansible webservers-a"uptime"□□□□□□□□□□□□□□□ansible-doc<□□□>□□□ping□□□□□□□□□□□9-4□□□



```
[root@SN2013-08-020 ~]# ansible-doc ping
> PING

  A trivial test module, this module always returns `pong' on
  successful contact. It does not make sense in playbooks, but it is
  useful from `/usr/bin/ansible'

# Test 'webservers' status
ansible webservers -m ping
```

□9-4　ping□□□□□□

□playbooks□□□□□□□□□□□□

```
- name□ reboot the servers
  action□ command /sbin/reboot -t now
```

Ansible 0.8□□□□□□□□□□□□

```
- name□ reboot the servers
  command□ /sbin/reboot -t now
```

Ansible□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Ansible□□□□□□□□□□□□□□□□□□

1.□□□□□□

□1□□□

□□□□command□script□shell□□□□□□□□shell□□□□□command□□Ansible□□□□□□□□□□□□□□□□□□□shell□□□script□□□□□□□□□□□□□□□□shell□□□□□□□□scp+shell□□□shell□□□□□□□□□□shell□□□□□

□2□□□

```
ansible webservers -m command -a "free -m"

ansible webservers -m script -a "/home/test.sh 12 34"

ansible webservers -m shell -a "/home/test.sh"
```

2.copy□□

□1□□□

□□□□□□□□□□□□□□□□□□scp□□□□

□2□□□

□□□□□□□□/home/test.sh□□□webserver□□□□□/tmp/□□□□□□□□□□□□□□□□□□□□□file□□□□□□□□□□□□□□path=/etc/foo.conf owner=foo group=foo mode=0644□□

```
#

ansible webservers -m copy -a "src=/home/test.sh dest=/tmp/
owner=root group=root mode=0755"
```

3.stat□□

□1□□□

□□□□□□□□□□□□□atime□ctime□mtime□md5□uid□gid□□□□

□2□□□

```
ansible webservers -m stat -a "path=/etc/sysctl.conf"
```

4.get_url□□

□1□□□

□□□□□□□□□□□URL□□□□□□sha256sum□□□□□

□2□□□

```
ansible webservers -m get_url -a "url=http□//www.baidu.com
dest=/tmp/index.html mode=0440 force=yes"
```

5.yum□□

□1□□□

Linux□□□□□□□□□□□□□yum□apt□□□□□

□2□□□

```
ansible webservers -m apt -a "pkg=curl state=latest"

ansible webservers -m yum -a "name=curl state=latest"
```

6.cron□□

□1□□□

□□□□crontab□□□

□2□□□

```
ansible webservers -m cron -a "name='check dirs' hour='5□2'
job='ls -alh > /dev/null'"
```

□□□□□

```
#Ansible□ check dirs

* 5□2 * * * ls -alh > /dev/nullsalt '*' file.chown
/etc/passwd root root
```

7.mount□□

□1□□□

[illegible]

[illegible]2[illegible]

```
ansible webservers -m mount -a "name=/mnt/data src=/dev/sd0
fstype=ext3 opts=ro state=present"
```

8.service[illegible]

[illegible]1[illegible]

[illegible]

[illegible]2[illegible]

```
ansible webservers -m service -a "name=nginx state=stopped"

ansible webservers -m service -a "name=nginx
state=restarted"

ansible webservers -m service -a "name=nginx
state=reloaded"
```

9.sysctl[illegible]

[illegible]1[illegible]

[illegible]Linux[illegible]sysctl[illegible]

[illegible]2[illegible]

```
sysctl□ name=kernel.panic value=3
sysctl_file=/etc/sysctl.conf checks=before reload=yessalt
'*' pkg.upgrade
```

10.user□□□□

□1□□□

□□□□□□□□□□

□2□□□

```
#□□□□johnd□

ansible webservers -m user -a "name=johnd comment='John
Doe'"

#□□□□johnd□

ansible webservers -m user -a "name=johnd state=absent
remove=yes"
```

□□ playbooks□□□□□□□□□ command□□□□□0.8□□□□□□□□□

-name□reboot the servers

command□/sbin/reboot-t now

9.6 playbook□□

playbook□□□□□□□□Ansible□□□□□□□□□□□□□□□□□□□□□□□□□playbook□□playbook□□□https://github.com/ansible/ansible-examples□□□playbook□□□YAML□□□□□□□□□□□□□□□□□□□□□□□□□□□□webservers□dbservers□□□□□□□□□□□□□□□□□□□□□□□playbook□□□

□/home/test/ansible/playbooks/nginx.yml□

```
---
- hosts□ webservers
  vars□
    worker_processes□ 4
    num_cpus□ 4
    max_open_file□ 65506
    root□ /data
  remote_user□ root
  tasks□
```

```
 - name□ ensure nginx is at the latest version

  yum□ pkg=nginx state=latest

 - name□ write the nginx config file

  template□ src=/home/test/ansible/nginx/nginx2.conf
dest=/etc/nginx/nginx.conf

  notify□

  - restart nginx

 - name□ ensure nginx is running

  service□ name=nginx state=started

 handlers□

  - name□ restart nginx

   service□ name=nginx state=restarted
```

□□playbook□□□□□□□□Nginx□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

9.6.1 □□□□□□□

□playbook□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□webservers□□□□□□□□□□□□□□□□□□webservers□□□□□□

```
- hosts□ webservers

 vars□

  worker_processes□ 4
```

```
    num_cpus[illegible] 4
    max_open_file[illegible] 65506
    root[illegible] /data
  remote_user[illegible] root
```

hosts[illegible]9.3.1[illegible]webservers[illegible]vars[illegible]4[illegible]remote_user[illegible]root[illegible]sudo[illegible]sudo[illegible]yes[illegible]remote_user[illegible]Ansible 1.4[illegible]

9.6.2 [illegible]

[illegible]tasks list[illegible]playbook[illegible]name[illegible]action[illegible]name[illegible]

```
tasks[illegible]
  - name[illegible] make sure nginx is running
    service[illegible] name=nginx state=running
```

□□□□□Nginx□□□□□□□□□□□□□□□□□□□name□□□□□□action□□□□□□□□□action□□□□□□□□□Ansible□□□□□□□□□9.5□□□□□services□□□□□□□key=value□□□□□“name=httpd”□□□□□□□□□□□□□□□□□□□□

```
tasks□

  - name□ create a virtual host file for {{ vhost }}

    template□ src=somefile.j2 dest=/etc/httpd/conf.d/{{
vhost }}
```

□playbook□□□template□□□□□□□□□□□□□□□□□□□□□□□□□nginx□□□□□□□□□□□□

```
  - name□ write the nginx config file

    template□ src=/home/test/ansible/nginx/nginx2.conf
dest=/etc/nginx/nginx.conf

    notify□

    - restart nginx
```

□
□□“src=/home/test/ansible/nginx/nginx2.conf”□□□□□□□□□□□
□□“dest=/etc/nginx/nginx.conf”□□□□□

nginx□□□□□□□□□□□nginx□□□□□□□□□□□□□□□□□□□□□□□

□/home/test/ansible/nginx/nginx2.conf□

```
user              nginx□

worker_processes  {{ worker_processes }}□

{% if num_cpus == 2 %}

worker_cpu_affinity 01 10□

{% elif num_cpus == 4 %}

worker_cpu_affinity 1000 0100 0010 0001□

{% elif num_cpus >= 8 %}

worker_cpu_affinity 00000001 00000010 00000100 00001000
00010000 00100000 01000000 10000000□

{% else %}

worker_cpu_affinity 1000 0100 0010 0001□

{% endif %}

worker_rlimit_nofile {{ max_open_file }}□

… …
```

Ansible□□□□□□□□□□□□□□□□□□□□□□□□YAML□□□□□□9.1□□□□□□□nginx.conf□□□□□

```
user              nginx□
```

```
worker_processes  4□

worker_cpu_affinity 1000 0100 0010 0001□

worker_rlimit_nofile 65506□

… …
```

□□□□□□□□□□□□□□□□□□□□□□Handlers□□□□□□□□□□□□□□nginx□□□Handlers□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Handlers□□□name□□□□□□□□□□□notify□□“restart nginx”□handlers□□“name□restart nginx”□□□□□

```
notify□

    - restart nginx

handlers□

    - name□ restart nginx

      service□ name=nginx state=restarted
```

9.6.3 □□playbook

□□playbook□□□□□ansible-playbook□□□□□□□□ansible-playbook playbook file□.yml□[□□]□□□□10□□□□□□□□playbook□

```
#ansible-playbook /home/test/ansible/playbooks/nginx.yml -f
10[illegible]
```

[illegible]

·-u REMOTE_USER[illegible]playbook[illegible]

·--syntax-check[illegible]playbook[illegible]

·--list-hosts playbooks[illegible]

·-T TIMEOUT[illegible]playbook[illegible]

·--step[illegible]

[illegible]ansible-playbook-help[illegible]

9.7 playbook□□□□□□□

□□□□□□□□□□playbook□□□□□□□□□□□□□□□□□□Ansible□□□playbook□□□□□□□□□□□□□□include□□□□□□□□□□□□□□□□□□□□□“□□”□□□□□□□□□□□□□□□□□

□□□Ansible□□□GitHub□□□□□□□□□□□□□□□□□□□□□ https://github.com/ansible/ansible-examples□□□□□□□□□□□

9.7.1 □□□□□□□□□

□□□playbook□□□include□□□□□□□□□□

□tasks/foo.yml□

```
---
# possibly saved as tasks/foo.yml
- name□ placeholder foo
  command□ /bin/foo
- name□ placeholder bar
  command□ /bin/bar
```

□□□□□□□□□playbook□include□□□□□

```
tasks□

- include□ tasks/foo.yml
```

□□□□□□□□□□□□□□□□□□□□□□“□□□□”□

□□□□□□WordPress□□□□□□□□□□□□□□□□□WordPress□□□□□□□□□wordpress.yml□□□□□□□□□

```
tasks□

  - include□ wordpress.yml user=timmy

  - include□ wordpress.yml user=alice

  - include□ wordpress.yml user=bob
```

□□□1.4□□□□□□□□□Python□□□□□□□□□□□□□□□□

```
tasks□

- { include□ wordpress.yml□ user□ timmy□ ssh_keys□ [
'keys/one.txt'□ 'keys/two.txt' ] }
```

[illegible]{{user}}[illegible]

[illegible]handlers[illegible]Apache[illegible]

[illegible]handlers/handlers.yml[illegible]

```
---
# this might be in a file like handlers/handlers.yml
- name： restart apache
  service： name=apache state=restarted
```

[illegible]

```
handlers：
  - include： handlers/handlers.yml
```

9.7.2 [illegible]

[illegible]Ansible[illegible]

```
site.yml
webservers.yml
fooservers.yml
roles/
   common/
     files/
     templates/
     tasks/
     handlers/
     vars/
     meta/
   webservers/
     files/
     templates/
     tasks/
     handlers/
     vars/
     meta/
```

□playbook□□□□□□ □site.yml□

```
---
- hosts： webservers
  roles：
     - common
     - webservers
```

[illegible]x[illegible]

·[illegible]roles/x/tasks/main.yml[illegible]

·[illegible]roles/x/handlers/main.yml[illegible]

·[illegible]roles/x/vars/main.yml[illegible]

·[illegible]roles/x/meta/main.yml[illegible]1.3[illegible]

·[illegible]roles/x/files/[illegible]

·[illegible]roles/x/files/[illegible]

·[illegible]roles/x/templates/[illegible]

[illegible]role[illegible]9.6[illegible]nginx[illegible]playbook[illegible]common[illegible]ntp[illegible]iptables[illegible]selinux[illegible]sysctl[illegible]ntp[illegible]

[illegible]1[illegible]playbook[illegible]

playbook[illegible]group_vars[illegible]hosts[illegible]site.yml[illegible]playbook[illegible]9-5[illegible]

[illegible]/home/test/ansible/playbooks/nginx[illegible]

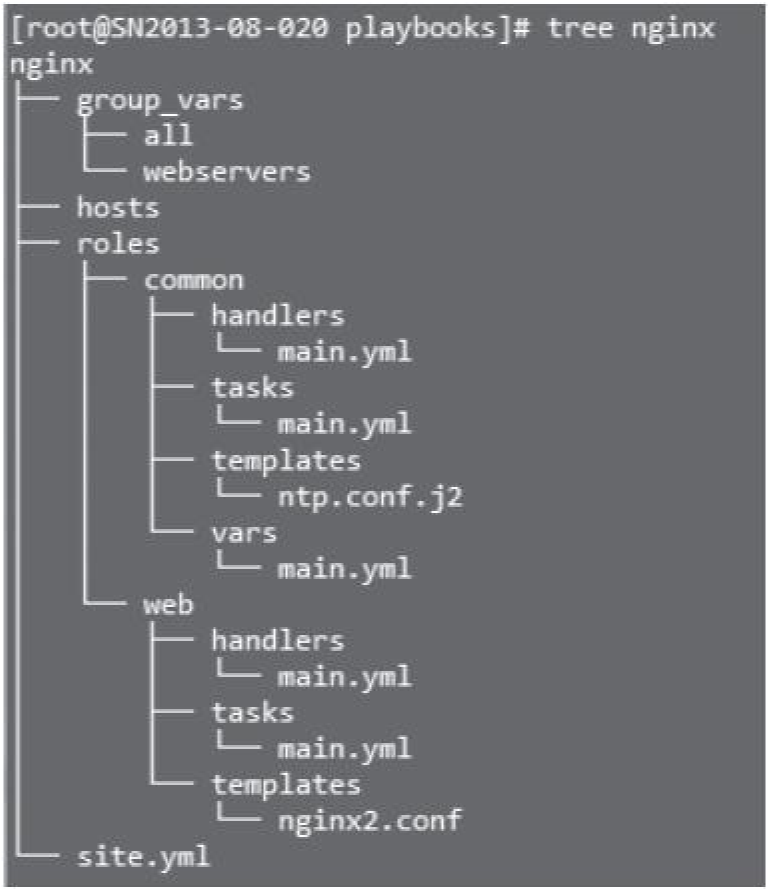
[illegible]2[illegible]

[illegible]webservers[illegible]

[illegible]nginx/hosts[illegible]

```
[webservers]

192.168.1.21

192.168.1.22
```

[illegible]/etc/ansible/hosts[illegible]“-i file”[illegible]ansible-playbook-i hosts[illegible]



```
[root@SN2013-08-020 playbooks]# tree nginx
nginx
├── group_vars
│   ├── all
│   └── webservers
├── hosts
├── roles
│   ├── common
│   │   ├── handlers
│   │   │   └── main.yml
│   │   ├── tasks
│   │   │   └── main.yml
│   │   ├── templates
│   │   │   └── ntp.conf.j2
│   │   └── vars
│   │       └── main.yml
│   └── web
│       ├── handlers
│       │   └── main.yml
│       ├── tasks
│       │   └── main.yml
│       └── templates
│           └── nginx2.conf
└── site.yml
```

□9-5 playbook□□□□□

□3□□□□□□□□□

□□□□□9.3□□□□group_vars□□all□□□□□□□

□nginx/group_vars/all□

```
---
# Variables listed here are applicable to all host groups
ntpserver□ ntp.sjtu.edu.cn
```

□nginx/group_vars/webservers□

```
---

worker_processes□ 4

num_cpus□ 4

max_open_file□ 65536

root□ /data
```

□4□□□□□□□site.yml

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□nginx/site.yml□

```
---

- name□ apply common configuration to all nodes

  hosts□ all

  roles□

    - common

- name□ configure and deploy the webservers and application
code

  hosts□ webservers

  roles□

    - web
```

[illegible]site.yml[illegible]common[illegible]web[illegible]nginx/common[illegible]nginx/web[illegible]db[illegible]nosql[illegible]hadoop[illegible]hosts[illegible]

[illegible]5[illegible]common[illegible]

[illegible]common[illegible]handlers[illegible]tasks[illegible]templates[illegible]vars 4[illegible]main.yml[illegible]vars/main.yml[illegible]/nginx/group_vars/all[illegible]ansible-playbook[illegible]

[illegible]handlers/main.yml[illegible]

```
- name： restart ntp

  service： name=ntpd state=restarted
```

[illegible]tasks/main.yml[illegible]

```
- name： Install ntp

  yum： name=ntp state=present

- name： Configure ntp file

  template： src=ntp.conf.j2 dest=/etc/ntp.conf
  notify□ restart ntp
- name□ Start the ntp service
  service□ name=ntpd state=started enabled=true
- name□ test to see if selinux is running
  command□ getenforce
  register□ sestatus
  changed_when□ false
```

□□template□src=ntp.conf.j2□□□□□□□□□□□□□□□□□templates□□□□□□

□templates/ntp.conf.j2□

```
driftfile /var/lib/ntp/drift
restrict 127.0.0.1
restrict -6 □□1
server {{ ntpserver }}
includefile /etc/ntp/crypto/pw
keys /etc/ntp/keys
```

□□{{ntpserver}}□□□vars/main.yml□□□ntpserver□□□

□vars/main.yml□

```
---
# Variables listed here are applicable to all host groups
ntpserver□ 210.72.145.44
```

□6□□□web□□□

□□web□□□handlers□tasks□templates□□□□□□□□□□9.6□□□nginx□□playbook□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□handlers/main.yml□

```
- name□ restart nginx
  service□ name=nginx state=restarted
```

□tasks/main.yml□

```
- name□ ensure nginx is at the latest version
  yum□ pkg=nginx state=latest
- name□ write the nginx config file
  template□ src=nginx2.conf dest=/etc/nginx/nginx.conf
  notify□
  - restart nginx
- name□ ensure nginx is running
  service□ name=nginx state=started
```

□templates/nginx2.conf□

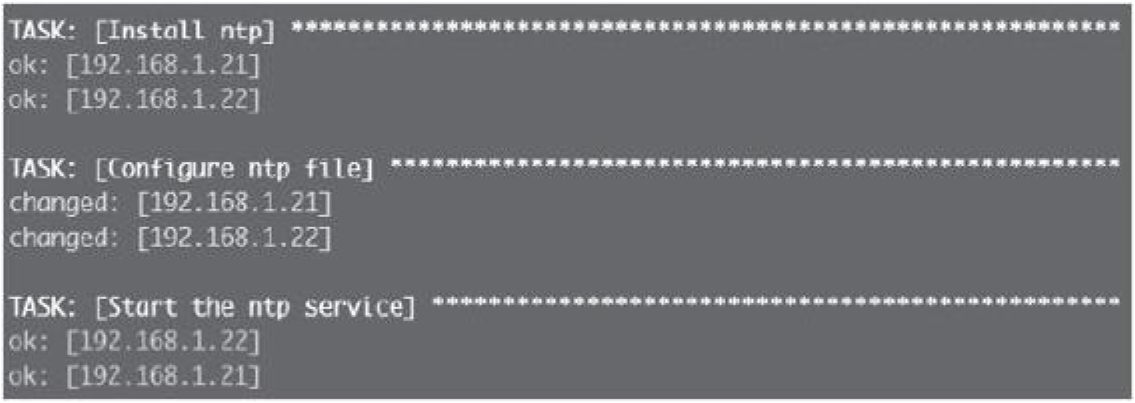
```
user              nginx□

worker_processes  {{ worker_processes }}□

{% if num_cpus == 2 %}

worker_cpu_affinity 01 10□

{% elif num_cpus == 4 %}

worker_cpu_affinity 1000 0100 0010 0001□

{% elif num_cpus >= 8 %}

worker_cpu_affinity 00000001 00000010 00000100 00001000
00010000 00100000 01000000 10000000□

{% else %}

worker_cpu_affinity 1000 0100 0010 0001□

{% endif %}

worker_rlimit_nofile {{ max_open_file }}□

……
```

□□web□□□□□□□□□□□□□□□□9.6□□common□□□□□□

□7□□□□□

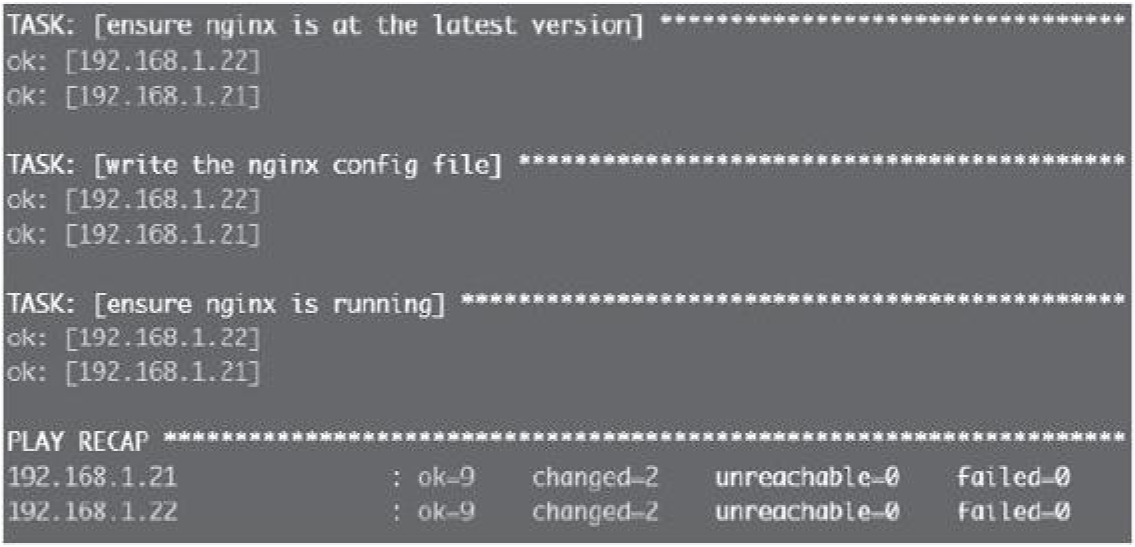
```
#cd /home/test/ansible/playbooks/nginx

#ansible-playbook -i hosts site.yml -f 10
```

□□□□□9-6□□9-7□□□



```
TASK: [Install ntp] ***********************************************************
ok: [192.168.1.21]
ok: [192.168.1.22]

TASK: [Configure ntp file] ****************************************************
changed: [192.168.1.21]
changed: [192.168.1.22]

TASK: [Start the ntp service] *************************************************
ok: [192.168.1.22]
ok: [192.168.1.21]
```

□9-6 ntp□□□□



```
TASK: [ensure nginx is at the latest version] *********************************
ok: [192.168.1.22]
ok: [192.168.1.21]

TASK: [write the nginx config file] *******************************************
ok: [192.168.1.22]
ok: [192.168.1.21]

TASK: [ensure nginx is running] ***********************************************
ok: [192.168.1.22]
ok: [192.168.1.21]

PLAY RECAP ********************************************************************
192.168.1.21               : ok=9    changed=2    unreachable=0    failed=0
192.168.1.22               : ok=9    changed=2    unreachable=0    failed=0
```

□9-7 nginx□□□□

9.8 [illegible]Facts

Facts[illegible]Saltstack[illegible]Grains[illegible]IP[illegible]playbook[illegible]httpd.conf[illegible]Facts[illegible]ServerName[illegible]ansible hostname-m setup[illegible]Facts[illegible]192.168.1.21[illegible]Facts[illegible]ansible 192.168.1.21-m setup[illegible]

```
192.168.1.21 | success >> {

    "ansible_facts"[illegible] {

        "ansible_all_ipv4_addresses"[illegible] [

            "192.168.1.21"

        ][illegible]

        "ansible_all_ipv6_addresses"[illegible] [

            "fe80[illegible]250[illegible]56ff[illegible]fe28[illegible]632d"

        ][illegible]

        "ansible_architecture"[illegible] "x86_64"[illegible]

        "ansible_bios_date"[illegible] "07/02/2012"[illegible]

        "ansible_bios_version"[illegible] "6.00"[illegible]

        "ansible_cmdline"[illegible] {

            "KEYBOARDTYPE"[illegible] "pc"[illegible]
            "KEYTABLE"□ "us"□
            "LANG"□ "en_US.UTF-8"□
            "SYSFONT"□ "latarcyrheb-sun16"□
            "quiet"□ true□
            "rd_NO_DM"□ true□
            "rd_NO_LUKS"□ true□
            "rd_NO_LVM"□ true□
            "rd_NO_MD"□ true□
            "rhgb"□ true□
            "ro"□ true□
            "root"□ "UUID=b8d29324-57b2-4949-8402-7fd9ad64ac5a"
        }□
……
```

□□□□□□□□□□Facts□□□

```
{{ ansible_devices.sda.model }}
{{ ansible_hostname }}
```

9.9 □□

□□□CPU□□□□□□Nginx□worker_processes□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Ansible□□□□□□□□□□□□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□“foo_port”□□□□□□□□□“foo5”□□□□□□“foo-port”□“foo port”□“foo.port”□“12”□□□□□□□□□□□Inventory□□□□□□9.3.2□□9.3.3□□□playbook□□□□□9.6□□□□□□□□□□□□□□

9.9.1 Jinja2□□□

Jinja2□Python□□□□□□□□□□□□□□□□□□□□□□Django□□□□□□□□□□□□□□□□□□□□□□□□□□□□http://jinja.pocoo.org/□□□□□□□Ansible□□Jinja2□□□□□□□Filters□□□□

□□□□□{{□□□|□□□□}}□

□□□□□□□□□□□□□□□□□□□□□□□□□□□

```
{{ path | basename }}
```

□□□□□□□□□□□

```
{{ path | dirname }}
```

□□□□□□□□□□□□□□“/etc/profile”□□□□□□□“profile”□□□□□□□□/tmp/testshell□□□□

```
---

- hosts□ 192.168.1.21

  vars□

    filename□ /etc/profile

  tasks□

    - name□ "shell1"

      shell□ echo {{ filename | basename }} >>
/tmp/testshell
```

□□□□□□□□ http://jinja.pocoo.org/docs/templates/#builtin-filters□

9.9.2 □□Facts

□□□□□□Facts□□Facts□□□□□□□□□□□□□□□□□□□□□□□□□□□□Facts□□□□□□□□□□□/etc/ansible/facts.d□□□□JSON□INI□□□□□□□

JSON□□□□□□□□□□□□“.fact”□□□□□□□□□□Ansible□□□Facts□□□□□□□□□192.168.1.21□□□□□□□□□playbook□□□□□

□/etc/ansible/facts.d/preferences.fact□

```
[general]

max_memory_size=32

max_user_processes=3730

open_files=65535
```

□□□□□□ansible 192.168.1.21-m setup-a"filter=ansible_local"□□□□□□□□□□□□□□□□□

```
192.168.1.21 | success >> {

    "ansible_facts"□ {

        "ansible_local"□ {

            "preferences"□ {

                "general"□ {

                    "max_memory_size"□ "32"□

                    "max_user_processes"□ "3730"□

                    "open_files"□ "65535"

                }

            }
        }
    }□
    "changed"□ false
}
```

□□□□JSON□□□□□□preferences□facts□□□□□□→general□INI□□□□→key□value□INI□□□□□□□□□□□□□□□□□□□playbook□□□□□□□□□□□□

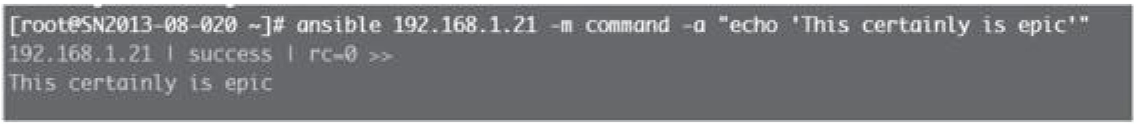
```
{{ ansible_local.preferences.general. open_files }}
```

9.9.3 □□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□playbook□□□□□□□□□□□□□□

```
- hosts□ web_servers
  tasks□
     - shell□ /usr/bin/foo
       register□ foo_result
       ignore_errors□ True
     - shell□ /usr/bin/bar
       when□ foo_result.rc == 5
```

□□□□□□□□□foo_result□□□□□□□shell□/usr/bin/foo□□□□□□ignore_errors□True□□□□□□□□□□□□□□□□□□□□playbook□□□□□□□□□□when□foo_result.rc==5□□□□shell□/usr/bin/bar□□□□□□□□□foo_result.rc□□□/usr/bin/foo□resultcode□□□□□□□9-8□□“rc=0”□□□□□



```
[root@SN2013-08-020 ~]# ansible 192.168.1.21 -m command -a "echo 'This certainly is epic'"
192.168.1.21 | success | rc=0 >>
This certainly is epic
```

□9-8　□□□□□□

9.10 [illegible]

[illegible]playbook[illegible]task[illegible]Ansible[illegible]

[illegible]When[illegible]

[illegible]Ansible[illegible]When[illegible]Jinja2[illegible]

```
tasks[illegible]
  - name[illegible] "shutdown Debian flavored systems"
    command[illegible] /sbin/shutdown -t now
    when[illegible] ansible_os_family == "Debian"
```

[illegible]Facts[illegible]ansible_os_family[illegible]Debian[illegible]BOOL[illegible]True[illegible]command[illegible]/sbin/shutdown-t now[illegible]False[illegible]

```
tasks[illegible]
```

```
- command□ /bin/false

  register□ result

  ignore_errors□ True

- command□ /bin/something

  when□ result|failed

- command□ /bin/something_else

  when□ result|success

- command□ /bin/still/something_else

  when□ result|skipped
```

“when□result|success”□□□□□□□result□□□□□□□□□□□□□□/bin/something_else□□□□□□□□□□success□Ansible□□□□□□□□□□Ture□□□□□□□□□

9.11 [illegible]

[illegible]Ansible[illegible]

```
- name[illegible] add several users
  user[illegible] name={{ item }} state=present groups=wheel
  with_items[illegible]
     - testuser1
     - testuser2
```

[illegible]with_items[illegible]“user[illegible]name={{item}}state=present groups=wheel”[illegible]with_items[illegible]2[illegible]testuser1[illegible]testuser2[illegible]{{item}}[illegible]

```
- name[illegible] add user testuser1
  user[illegible] name=testuser1 state=present groups=wheel
- name[illegible] add user testuser2
  user[illegible] name=testuser2 state=present groups=wheel
```

□□□□□□□□□□□□□□□□□

```
- name□ add several users

  user□ name={{ item.name }} state=present groups={{
item.groups }}

  with_items□

    - { name□ 'testuser1'□ groups□ 'wheel' }

    - { name□ 'testuser2'□ groups□ 'root' }
```

□□□□□□□□List□□□□□□□□□□with_flattened□□□□□□□□□□

```
----

# file□ roles/foo/vars/main.yml

packages_base□

  - [ 'foo-package'□ 'bar-package' ]

packages_apps□

  - [ ['one-package'□ 'two-package' ]]

  - [ ['red-package']□ ['blue-package']]
```

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

```
- name□ flattened loop demo
```

```
yum□ name={{ item }} state=installed

with_flattened□

    - packages_base

    - packages_apps
```

□□□□with_flattened□□□□□□□□□□□□□□□

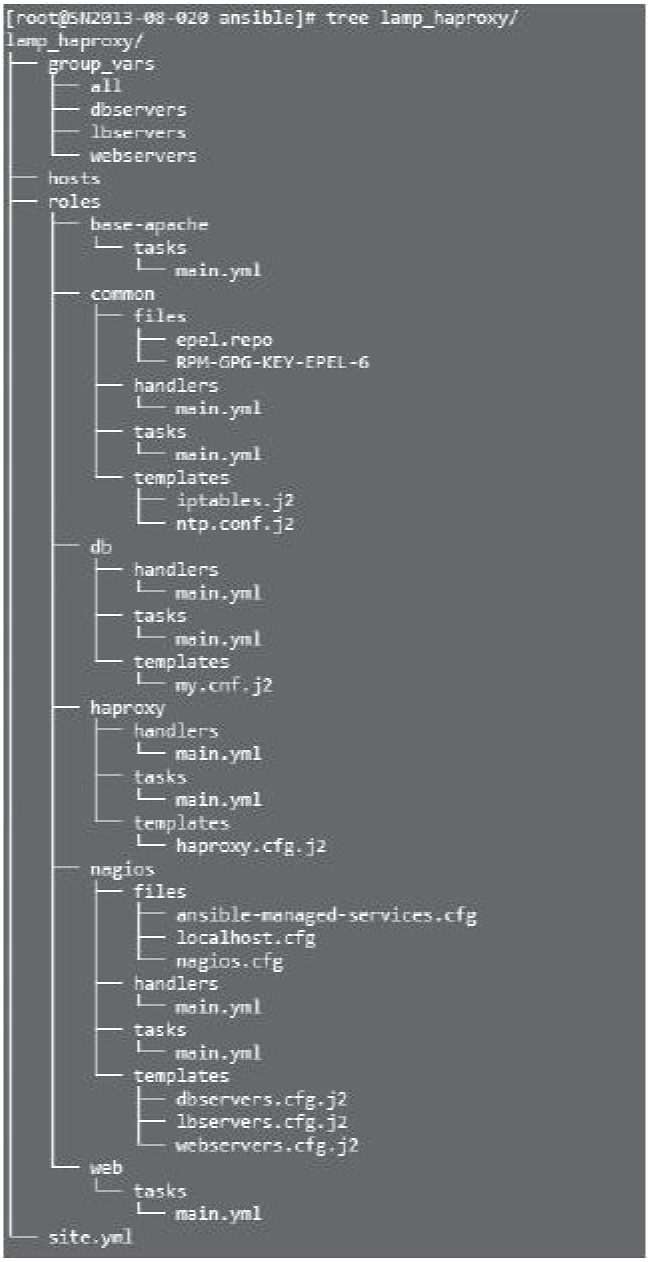
9.12 [illegible]

[illegible]Haproxy+LAMP+Nagios[illegible]
https://github.com/ansible/ansible-examples/tree/master/lamp_haproxy[illegible]Ansible[illegible]

[illegible]playbook[illegible]

1.[illegible]

[illegible]playbook[illegible]9-9[illegible]



```
[root@SN2013-08-020 ansible]# tree lamp_haproxy/
lamp_haproxy/
├── group_vars
│   ├── all
│   ├── dbservers
│   ├── lbservers
│   └── webservers
├── hosts
├── roles
│   ├── base-apache
│   │   └── tasks
│   │       └── main.yml
│   ├── common
│   │   ├── files
│   │   │   ├── epel.repo
│   │   │   └── RPM-GPG-KEY-EPEL-6
│   │   ├── handlers
│   │   │   └── main.yml
│   │   ├── tasks
│   │   │   └── main.yml
│   │   └── templates
│   │       ├── iptables.j2
│   │       └── ntp.conf.j2
│   ├── db
│   │   ├── handlers
│   │   │   └── main.yml
│   │   ├── tasks
│   │   │   └── main.yml
│   │   └── templates
│   │       └── my.cnf.j2
│   ├── haproxy
│   │   ├── handlers
│   │   │   └── main.yml
│   │   ├── tasks
│   │   │   └── main.yml
│   │   └── templates
│   │       └── haproxy.cfg.j2
│   ├── nagios
│   │   ├── files
│   │   │   ├── ansible-managed-services.cfg
│   │   │   ├── localhost.cfg
│   │   │   └── nagios.cfg
│   │   ├── handlers
│   │   │   └── main.yml
│   │   ├── tasks
│   │   │   └── main.yml
│   │   └── templates
│   │       ├── dbservers.cfg.j2
│   │       ├── lbservers.cfg.j2
│   │       └── webservers.cfg.j2
│   └── web
│       └── tasks
│           └── main.yml
└── site.yml
```

□9-9 □□□□□□

2.□□□□□□

□□Web□□□1□□□□□□□1□□□□□□□□□1□□□□□□hosts□□□□□

□hosts□

```
[webservers]

web1

web2

[dbservers]

db1

[lbservers]

lb1

[monitoring]

nagios
```

3.palybook□□□□site.yml

□□□□□□base-apache□□□□□webservers□monitoring□□□□□Apache□□□□□□□□□□□□□Apache□□□base-apache□□□

□Site.yml□

```
---

- hosts□ all

  roles□

  - common

- hosts□ dbservers
```

```
    user□ root
    roles□
    - db
  - hosts□ webservers
    user□ root
    roles□
    - base-apache
    - web
  - hosts□ lbservers
    user□ root
    roles□
    - haproxy
  - hosts□ monitoring
    user□ root
    roles□
    - base-apache
    - nagios
```

4.□□□□□

□□□□playbook□□□□□□□□□□□□□□□□
□group_vars/all□

```
---
# Variables here are applicable to all host groups
httpd_port□ 80
ntpserver□ 192.168.1.2
```

all□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ntpserver□□□sysctl□□□iptables□□□□

□□□□□webservers□□□□□□□□□□□webservers□□□□

□group_vars/webservers□

```
---
# Variables for the web server configuration
# Ethernet interface on which the web server should listen.
# Defaults to the first interface. Change this to□
#
#  iface□ eth1
#
# ...to override.
#
iface□ '{{ ansible_default_ipv4.interface }}'
# this is the repository that holds our sample webapp
repository□ https□//github.com/bennojoy/mywebapp.git
```

```
# this is the sha1sum of V5 of the test webapp.

webapp_version□ 351e47276cc66b018f4890a04709d4cc3d3edb0d
```

webservers□□□□□webservers□□□□□□□□□□□□□Apache□□□□□□□“iface□'{{ansible_default_ipv4.interface}}'”□□□Facts□□□□□□□□□□□□□□□□□□□□GitHub□repository□□□□□Web□□□□□□□□□□git□□□□□□□□□□□□□□□□□□□□□□□

□□□□□dbservers□□□□□□□□□□□dbservers□□□□

□group_vars/dbservers□

```
---

# The variables file used by the playbooks in the dbservers
group.

# These don't have to be explicitly imported by vars_files□
they are autopopulated.

mysqlservice□ mysqld

mysql_port□ 3306

dbuser□ root

dbname□ foodb

upassword□ abc
```

dbservers□□□□□dbservers□□□□□□□□□□□□MySQL□□□□□□□□□□□

□□□□□lbservers□□□□□□□□□□□□□□□□haproxy□□□□□□□□□□□

□group_vars/lbservers□

```
---

# Variables for the HAproxy configuration

# HAProxy supports "http" and "tcp". For SSL□ SMTP□ etc□
use "tcp".

mode□ http

# Port on which HAProxy should listen

listenport□ 8888

# A name for the proxy daemon□ this wil be the suffix in
the logs.

daemonname□ myapplb

# Balancing Algorithm. Available options□

# roundrobin□ source□ leastconn□ source□ uri

# □if persistance is required use□ "source"□

balance□ roundrobin

# Ethernet interface on which the load balancer should
listen

# Defaults to the first interface. Change this to□

#
```

```
#  iface□ eth1

#

# ...to override.

#

iface□ '{{ ansible_default_ipv4.interface }}'
```

5.playbook□□□□

□□□□□□6□□□□□□base-apache□common□db□haproxy□nagios□web□□□□□6□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□base-apache□□□nginx□□□□site.yml□□□□

□1□common□□

common□□□□□□□□□□□□□□□□□□□□yum□□□□nagios□□□NTP□□□iptables□SELinux□□□□□tasks□□□□□□□

□roles/common/tasks/main.yml□

```
---

# This role contains common plays that will run on all
nodes.

- name□ Create the repository for EPEL

  copy□ src=epel.repo dest=/etc/yum.repos.d/epel.repo
```

```
- name： Create the GPG key for EPEL
  copy： src=RPM-GPG-KEY-EPEL-6 dest=/etc/pki/rpm-gpg
- name： install some useful nagios plugins
  yum： name={{ item }} state=present
  with_items：
   - nagios-nrpe
   - nagios-plugins-swap
   - nagios-plugins-users
   - nagios-plugins-procs
   - nagios-plugins-load
   - nagios-plugins-disk
- name： Install ntp
  yum： name=ntp state=present
  tags： ntp
- name： Configure ntp file
  template： src=ntp.conf.j2 dest=/etc/ntp.conf
  tags： ntp
  notify： restart ntp
- name： Start the ntp service
  service： name=ntpd state=started enabled=true
  tags： ntp
- name： insert iptables template
  template： src=iptables.j2 dest=/etc/sysconfig/iptables
```

```
    notify□ restart iptables

  - name□ test to see if selinux is running

    command□ getenforce

    register□ sestatus

    changed_when□ false
```

□□□□□□□□□□□□□□□copy□□□src□□□□□□□□□□□roles/common/files□□□with_item□□□□□□□□nagios□□□□□□□ntp□□□□□□□□□roles/common/templatesntp.conf.j2□□□□□□□□□/etc/ntp.conf□□□□□□□iptables□□□roles/common/templates/iptables.j2□□□“notify□restart iptables”□□□□□□□□□□□□□□□□□□□handlers□□□□□“command□getenforce”□□getenforce□□□selinux□□□□□□□□“changed_when□false”□□□□□□□□□□□□□changed□□□□changed□False□

□□□□common□□□□□□□□

□roles/common/handlers/main.yml□

```
  ---

  # Handlers for common notifications

  - name□ restart ntp
```

```
    service□ name=ntpd state=restarted

  - name□ restart iptables

    service□ name=iptables state=restarted
```

□□□□□□□□□□□□□□□□□□□□□ntp□iptables□□□□□“name□restart ntp”□□□□tasks□□□□□“notify□restart ntp”□□□□□□□“name□restart iptables”□□□

□□□□□common□□iptables□□□□□□

□roles/common/templates/iptables.j2□

```
  {% if □inventory_hostname in groups['webservers']□ or
  □inventory_hostname in groups['monitoring']□ %}

  -A INPUT -p tcp  --dport 80 -j ACCEPT

  {% endif %}

  … …

  {% for host in groups['monitoring'] %}

  -A INPUT -p tcp -s {{
  hostvars[host].ansible_default_ipv4.address }} --dport 5666
  -j ACCEPT

  {% endfor %}
```

“inventory_hostname”□□□□□Ansible□inventory□□□□□□□□IP□□□□□□□□□Facts□□□□□

□ansible_hostname□□□□□□□□□□□inventory_hostname□□ansible_hostname□□□□□□□□□□Ansible□inventory□□□IP□□□□ansible_hostname□□□□□□□□□□□□jinja2□□□□□□if...endif□□□□□□□inventory_hostname□□□webservers□monitoring□□□□□□□□hosts□□□□□□□□□□□□80□□□□□□□-A INPUT-p tcp--dport 80-j ACCEPT□□For...endfor□□□□□□□□□□□monitoring□□□□□5666□□□□□hostvars[host]□□□□□□□□□□□□□□Facts□□□□hostvars[host].ansible_default_ipv4.address□□□□IP□

□2□haproxy□□

haproxy□□□□□□□haproxy□□□□□□□□□□□□□□□tasks□□□□□

□roles/haproxy/tasks□

```
---
# This role installs HAProxy and configures it.
- name□ Download and install haproxy and socat
  yum□ name={{ item }} state=present
  with_items□
  - haproxy
```

```
    - socat

  - name□ Configure the haproxy cnf file with hosts

    template□ src=haproxy.cfg.j2
  dest=/etc/haproxy/haproxy.cfg

    notify□ restart haproxy
```

□□□tasks□□□□□□□□□□□□□□□□□□□□□□□□□□□□yum□□□□□□□haproxy□socat□□□□□□□□□□□□□□□roles/haproxy/templates/haproxy.cfg.j2□□□□□□□□□□□□□□□/etc/haproxy/haproxy.cfg□□□□□□□□□□□□haproxy□□□□□□□□

□□□□□haproxy□□haproxy.cfg□□□□□□

□roles/haproxy/templates/haproxy.cfg.j2□

```
  … …

  backend app

      {% for host in groups['lbservers'] %}

          listen {{ daemonname }} {{ hostvars[host]
  ['ansible_' + iface].ipv4.

  address }}□{{ listenport }}

      {% endfor %}

      balance     {{ balance }}

      {% for host in groups['webservers'] %}

          server {{ hostvars[host].ansible_hostname }} {{
```

```
hostvars[host]

['ansible_' + iface].ipv4.address }}□{{ httpd_port }}

    {% endfor %}
```

{{hostvars[host]['ansible_'+iface].ipv4.address}}□□□□□□□□□iface□group_vars/lbservers□□□□□IPv4 IP□□□

□3□web□□

web□□□□□□□php□php-mysql□git□□□□□SELinux□□□□□□□□□tasks□□□□□□□

□roles/web/tasks/main.yml□

```
---

# httpd is handled by the base-apache role upstream

- name□ Install php and git

  yum□ name={{ item }} state=present

  with_items□

   - php

   - php-mysql

   - git

- name□ Configure SELinux to allow httpd to connect to
remote database
```

```
  seboolean□ name=httpd_can_network_connect_db state=true
persistent=yes

  when□ sestatus.rc □= 0

- name□ Copy the code from repository

  git□ repo={{ repository }} version={{ webapp_version }}
dest=/var/www/html/
```

□□sestatus□□□roles/common/tasks/main.yml□□□□□□□rc□□□□□□□□□0□□□□□□□selinux httpd□□□□□□□□□□□□□□□Ansible□seboolean□□□□□□□□□□□□□“setsebool httpd_can_network_connect_db 1”□□□“persistent=yes”□□□□□□□□

□4□nagios□□

nagios□□□□□□□nagios□□□□□□□□□□□□□□□tasks□□□□□

□roles/nagios/tasks/main.yml□

```
… …

- name□ create the nagios object files

  template□ src={{ item + ".j2" }}

            dest=/etc/nagios/ansible-managed/{{ item }}
```

```
    with_items□
      - webservers.cfg
      - dbservers.cfg
      - lbservers.cfg
    notify□ restart nagios
```

template□□□□□□□□□□□□□with_items□□□□□□□□□□□□□“+”□□□□□□□jinja2□□□□

□□□□4□□□□□□□□□□□ansible-examples□□playbook□□□□□□□□□□□□□□□□□□□□□□

□□□□

·9.1□YAML□□□□□□http://zh.wikipedia.org/zh-cn/YAML□

·9.2□~9.11□Ansible□□□□□□□http://docs.ansible.com□□□□□

[illegible]10[illegible] [illegible]Saltstack[illegible]

Saltstack[illegible]http://www.saltstack.com/[illegible]2011[illegible]puppet[illegible]http://puppetlabs.com/[illegible]func[illegible]https://fedorahosted.org/func/[illegible]Saltstack[illegible]Python[illegible]ZeroMQ[illegible]Python[illegible]Pyzmq[illegible]PyCrypto[illegible]Pyjinja2[illegible]python-msgpack[illegible]PyYAML[illegible]Saltstack[illegible]

·[illegible]

·[illegible]UNIX/Linux[illegible]Windows[illegible]

·[illegible]

·[illegible]

·[illegible]master[illegible]minion[illegible]

·[illegible]API[illegible]Python[illegible]

[illegible]Saltstack[illegible]Saltstack[illegible]

[illegible]Saltstack[illegible]
https://github.com/saltstack[illegible]

[illegible]Saltstack[illegible]

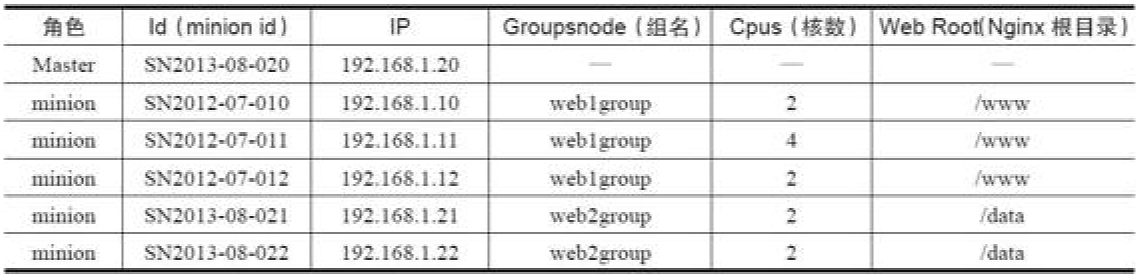
10.1 Saltstack[illegible]

Saltstack[illegible]yum[illegible]

10.1.1 [illegible]

[illegible]CentOS release 6.4[illegible]Python 2.6.6[illegible]10-1[illegible]CPU[illegible]Nginx[illegible]

[illegible]10-1 [illegible]



角色	Id（minion id）	IP	Groupsnode（组名）	Cpus（核数）	Web Root(Nginx 根目录)
Master	SN2013-08-020	192.168.1.20	—	—	—
minion	SN2012-07-010	192.168.1.10	web1group	2	/www
minion	SN2012-07-011	192.168.1.11	web1group	4	/www
minion	SN2012-07-012	192.168.1.12	web1group	2	/www
minion	SN2013-08-021	192.168.1.21	web2group	2	/data
minion	SN2013-08-022	192.168.1.22	web2group	2	/data

10.1.2 [illegible]EPEL

[illegible]RHEL[illegible]yum[illegible]Saltstack[illegible]EPEL[illegible]Saltstack[illegible]yum[illegible]

·RHEL[illegible]CentOS[illegible]5[illegible]rpm-Uvh[illegible]http://mirror.pnl.gov/epel/5/i386/epel-release-5-4.noarch.rpm

·RHEL□CentOS□6□□□rpm-Uvh□□□□□http://ftp.linux.ncsu.edu/pub/epel/6/i386/epel-release-6-8.noarch.rpm

10.1.3 □□Saltstack

□1□□□□□□□□□□□□

```
#yum install salt-master -y

#chkconfig salt-master on

#service salt-master start
```

□2□□□□□□□□□□□□

```
#yum install salt-minion -y

#chkconfig salt-minion on

#service salt-minion start
```

10.1.4 Saltstack□□□□□

□□□□□□TCP 4505□TCP 4506□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□zeromq□□□□□□□□□□□□□□□□□□□□□□□□□□□□□iptables□□□

```
iptables -I INPUT -m state --state new -m tcp -p tcp --
dport 4505 -j ACCEPT
```

```
iptables -I INPUT -m state --state new -m tcp -p tcp --
dport 4506 -j ACCEPT
```

10.1.5 □□Saltstack□□□□□□□

Saltstack□□□□□□□□□master□□□□□□□□□□
minion□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
□□□□□

□1□master□□□□□

1□□□□□□□□□□□□

□/etc/salt/master□

```
#□□Master□□IP□

interface□ 192.168.1.20

#□□□□□□□□□□□salt-key□□□□□□□□

auto_accept□ True

#□□Saltstack□□□□□□□

file_roots□

  base□

    - /srv/salt
```

2□□□saltstack salt-master□□□□□□□□□□□□□□
□□□□

```
#service salt-master restart
```

[illegible]2[illegible]minion[illegible]

1[illegible]

[illegible]/etc/salt/minion[illegible]

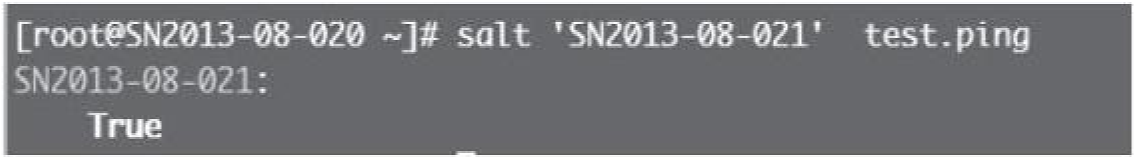
```
#[illegible]master[illegible]IP[illegible]

master[illegible] 192.168.1.20

#[illegible]id[illegible]

id[illegible] SN2013-08-021
```

2[illegible]saltstack salt-minion[illegible]

```
service salt-minion restart
```

[illegible]3[illegible]

[illegible]test[illegible]ping[illegible]'*'[illegible]'SN2013-08-021'[illegible]10-1[illegible]



```
[root@SN2013-08-020 ~]# salt 'SN2013-08-021'  test.ping
SN2013-08-021:
    True
```

[illegible]10-1 [illegible]

[illegible] [illegible]/etc/salt/master[illegible]auto_accept[illegible]True[illegible]salt-key[illegible]

·salt-key–L[illegible]id[illegible]Accepted Keys[illegible]Unaccepted Keys[illegible]

·salt-key–D[illegible]id[illegible]

·salt-key-d id[illegible]id[illegible]

·salt-key–A[illegible]id[illegible]

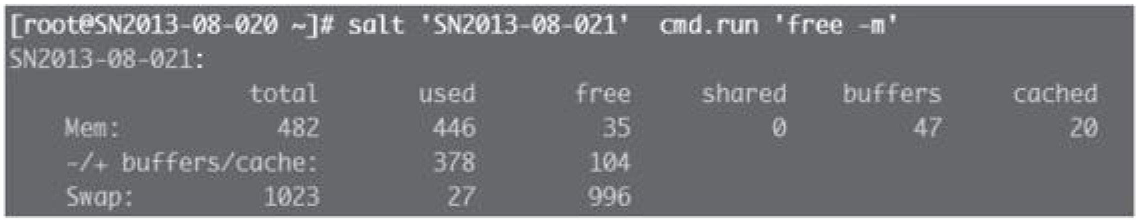
·salt-key-a id[illegible]id[illegible]

10.2 [illegible]Saltstack[illegible]

Saltstack[illegible]func[illegible]https://fedorahosted.org/func/[illegible]

[illegible]salt'<[illegible]>'<[illegible]>[[illegible]]

[illegible]10-2[illegible]

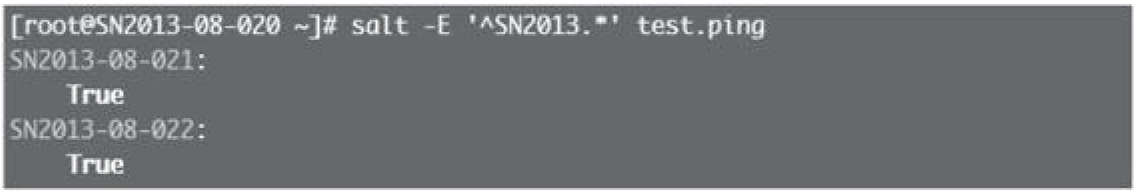


```
[root@SN2013-08-020 ~]# salt 'SN2013-08-021'  cmd.run 'free -m'
SN2013-08-021:
                 total       used       free     shared    buffers     cached
    Mem:           482        446         35          0         47         20
    -/+ buffers/cache:        378        104
    Swap:         1023         27        996
```

[illegible]10-2 [illegible]“SN2013-08-021”[illegible]

[illegible]<[illegible]>[illegible]Saltstack[illegible]id[illegible]

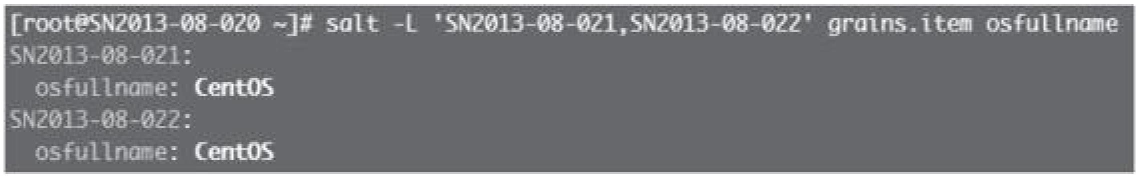
1[illegible]-E[illegible]--pcre[illegible]SN2013[illegible]id[illegible]salt-E'^SN2013.*'test.ping[illegible]10-3[illegible]



```
[root@SN2013-08-020 ~]# salt -E '^SN2013.*' test.ping
SN2013-08-021:
    True
SN2013-08-022:
    True
```

[illegible]10-3 [illegible]

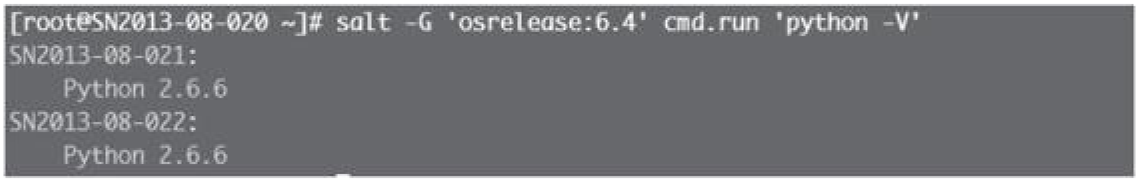
2□-L□--list□□□□id□□□□□□□□□□□□□□Python□□□□□□□□□□□id□□□□□□□□□□□□□□□□id□□SN2013-08-021□SN2013-08-022□□□□□□□□□□□□□□□□□□salt-L'SN2013-08-021□SN2013-08-022'grains.item osfullname□□□□□□□10-4□□□



```
[root@SN2013-08-020 ~]# salt -L 'SN2013-08-021,SN2013-08-022' grains.item osfullname
SN2013-08-021:
  osfullname: CentOS
SN2013-08-022:
  osfullname: CentOS
```

□10-4　□□□□□□□□□□□□□□□

3□-G□--grain□□□□□□□□grains□10.4□□□□□□□□□□□□□□□□'<grain value>□<glob expression>'□□□□□□□□□Linux□□□□□□□'kernel□Linux'□□□□□□□□□□□□□□□□□□□--grain-pcre□□□□□□□□□□□□□□□□□□□6.4□Python□□□□□□□salt-G'osrelease□6.4'cmd.run'python-V'□□□□□□□10-5□□□

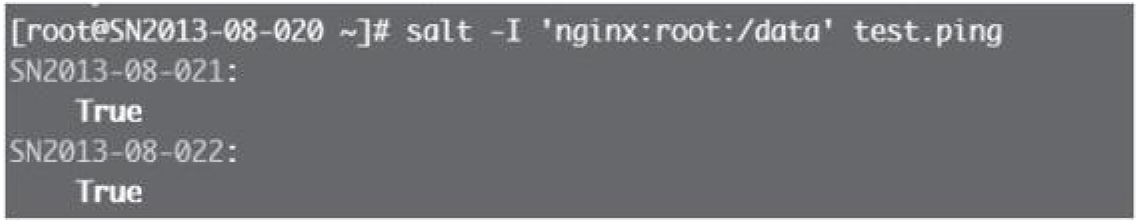


```
[root@SN2013-08-020 ~]# salt -G 'osrelease:6.4' cmd.run 'python -V'
SN2013-08-021:
    Python 2.6.6
SN2013-08-022:
    Python 2.6.6
```

□10-5　grain□□□□□□□Python□□

4□-I□--pillar□□□□□□□□pillar□10.5□□□□□□□□□□□□□□□□“□□□□□□□□”□□□□□□□□□□'apache□

httpd'pillar□□□□□□□□□□□□“nginx□root□/data”□□□□□□□□□□□□salt-I'nginx□root□/data'test.ping□□□□□□10-6□□□



```
[root@SN2013-08-020 ~]# salt -I 'nginx:root:/data' test.ping
SN2013-08-021:
    True
SN2013-08-022:
    True
```

□10-6　pillar□□□□□□□□□□

□□pillar□□□□□□□□□□□pillar□□10.5□□□□□□□□

```
nginx□

    root□ /data
```

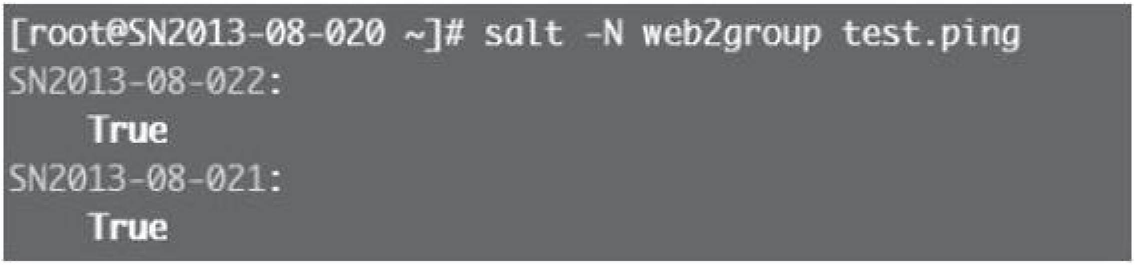
5□-N□--nodegroup□□□□□□master□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□grain□□□

□/etc/salt/master□

```
nodegroups□

   web1group□ 'L@SN2012-07-010□SN2012-07-011□SN2012-07-012'

   web2group□ 'L@SN2013-08-021□SN2013-08-022'
```

□□□L@□□□□□□□id□□□□□□□□□id□□□□□□G@□□□grain□□□□□S@□□□IP□□□□□□□□□□

□□□□□web2group□□□□□□□□□□□□□□salt-N web2group test.ping□□□□□□□10-7□□□



```
[root@SN2013-08-020 ~]# salt -N web2group test.ping
SN2013-08-022:
    True
SN2013-08-021:
    True
```

□10-7　□□□□□nodegroup□□□□□□□□□

6□-C□--compound□□□□□□□□not□and□or□□□□□□□□□□□□□□□□□□SN2013□□□□□□□□□□□CentOS□□□□□□□□□□□□

```
salt -C 'E@^SN2013.* and G@os□Centos' test.ping
```

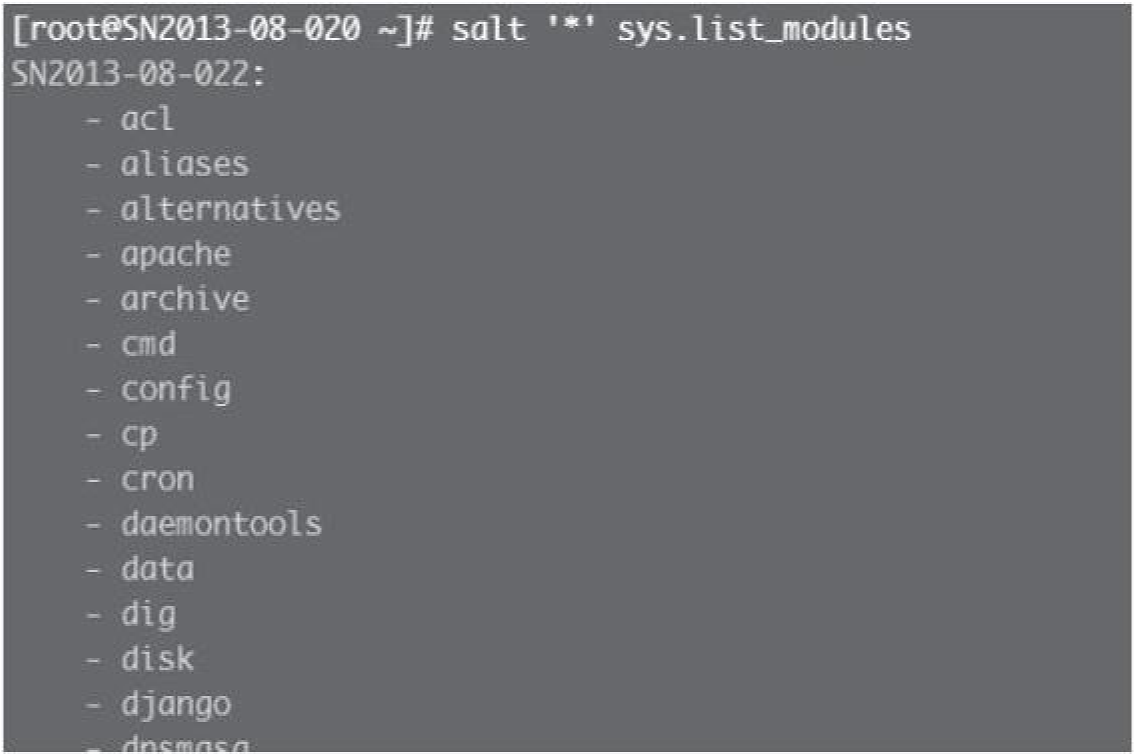
□□□not□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□SN2013□□□□□□□□□□□□□□salt-C'*and not E@^SN2013.*'test.ping□

7□-S□--ipcidr□□□□□□□□IP□□□IP□□□□□□□□□□□□

```
salt -S 192.168.0.0/16 test.ping
salt -S 192.168.1.10 test.ping
```

10.3 Saltstack□□□□□API

Saltstack□□http://docs.saltstack.com/ref/modules/all/index.html□□□□□□□□□sys□□□□□□□□□□□□□□□10-8□□□



```
[root@SN2013-08-020 ~]# salt '*' sys.list_modules
SN2013-08-022:
    - acl
    - aliases
    - alternatives
    - apache
    - archive
    - cmd
    - config
    - cp
    - cron
    - daemontools
    - data
    - dig
    - disk
    - django
    - dnsmasq
```

□10-8 □□□□Saltstack□□□□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□API□□□□□API□□□□□□□□master client□□□□□□□□LocalClient□□□□□□cmd□□□□□□□□□□□□API□□test.ping□□□□

```
import salt.client

client = salt.client.LocalClient□□

ret = client.cmd□'*'□ 'test.ping'□

print ret
```

□□□□□□□□Python□□□□□□□□□□□□□□□eval□□□□□□Python□□□□□□□□□□□□□□□□□□□□□□□□□□□

```
{'SN2013-08-022'□ True□ 'SN2013-08-021'□ True}
```

□□ □□□□□□□□Python□□□□□□□□□□ast□□□literal_eval□□□□□□□□□□□□□□□□□□□

□1□Archive□□

1□□□□□□□□□□□□□□□□□□□gunzip□gzip□rar□tar□unrar□unzip□□

2□□□□

```
#□□gzunzip□□/tmp/sourcefile.txt.gz□

salt '*' archive.gunzip /tmp/sourcefile.txt.gz
```

```
#□□gzip□□/tmp/sourcefile.txt□□

salt '*' archive.gzip /tmp/sourcefile.txt
```

3□API□□□

```
client.cmd□'*'□ ' archive.gunzip'□['/tmp/sourcefile.txt.gz
']□
```

□2□cmd□□

1□□□□□□□□□□□□□□□□□□□□□root□□□□□□□□□□□□□□□

2□□□□

```
#□□□□□□□□□□□□□□□

salt '*' cmd.run "free -m"

#□SN2013-08-021□□□□test.sh□□□□□script/test.sh□□□file_roots□
□□□□□

#□□□□□□□□□□□□□□test.sh□minion□cache□□□□□□□/var/cache/salt/
#minion/files/base/script/test.sh□□□□□□□□□

'SN2013-08-021' cmd.script salt□//script/test.sh
```

3□API□□□

```
client.cmd□'SN2013-08-021'□ 'cmd.run'□['free -m']□
```

□3□cp□□

1□□□□□□□□□□□□□□□□□□□□□URL□□□□□□

2□□□□

```
#□□□□□□□□/etc/hosts□□□□□□□□□□□□salt cache□□
□/var/cache/salt/minion/localfiles/□□

salt '*' cp.cache_local_file /etc/hosts

#□□□□□file_roots□□□□□□□□□□□□□□□

salt '*' cp.get_dir salt□//path/to/dir/ /minion/dest

#□□□□□file_roots□□□□□□□□□□□□□□□

salt '*' cp.get_file salt□//path/to/file /minion/dest

#□□URL□□□□□□□□□□□

salt '*' cp.get_url http□//www.slashdot.org /tmp/index.html
```

3□API□□□

```
client.cmd□'SN2013-08-021'□ 'cp.get_file'□['
salt□//path/to/file '□' /minion/dest']□
```

□4□cron□□

1□□□□□□□□□□□crontab□□□

2□□□□

```
#□□□□□□□□□root□□□crontab□□

salt 'SN2013-08-022' cron.raw_cron root

#□□□□□□□□□root□□□□/usr/local/weekly□□□□

salt 'SN2013-08-022' cron.set_job root '*' '*' '*' '*' 1
/usr/local/weekly

#□□□□□□□□□□root□□crontab□/usr/local/weekly□□□□

salt 'SN2013-08-022' cron.rm_job root /usr/local/weekly
```

3□API□□□

```
client.cmd□'SN2013-08-021'□ 'cron.set_job'□
['root'□'*'□'*'□'*'□'*'□'*'□'/usr/echo']□
```

□5□dnsutil□□

1□□□□□□□□□□□□DNS□□□□□

2□□□□

```
#□□□□□□□hosts□□□□□

salt '*' dnsutil.hosts_append /etc/hosts 127.0.0.1
ad1.yuk.com□ad2.yuk.com

#□□□□□□□hosts□□□□□

salt '*' dnsutil.hosts_remove /etc/hosts ad1.yuk.com
```

3□API□□□

```
client.cmd□'*'□ 'dnsutil.hosts_append'□
['/etc/hosts'□'127.0.0.1'□'ad1.yuk.co']□
```

□6□file□□

1□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

2□□□□

```
#□□□□□□□□/etc/fstab□□□md5□□□
6254e84e2f6ffa54e0c8d9cb230f5505□□□□□□True

salt '*' file.check_hash /etc/fstab
md5=6254e84e2f6ffa54e0c8d9cb230f5505

#□□□□□□□□□□□□□□□□□□md5□sha1□sha224□sha256□sha384□sha512□□□□

salt '*' file.get_sum /etc/passwd md5

#□□□□□□□□/etc/passwd□□□□□□□□□□□□□□chown root□root
/etc/passwd

salt '*' file.chown /etc/passwd root root

#□□□□□□□□□□/path/to/src□□□□□□/path/to/dst□□

salt '*' file.copy /path/to/src /path/to/dst

#□□□□□□□□/etc□□□□□□□□□□□□True□□□□□□□□□□□file.file_exists□□

salt '*' file.directory_exists /etc

#□□□□□□□□/etc/passwd□stats□□

salt '*' file.stats /etc/passwd

#□□□□□□□□/etc/passwd□□□mode□□755□644

salt '*' file.get_mode /etc/passwd
```

```
#□□□□□□□□/etc/passwd□□□mode□0644

salt '*' file.set_mode /etc/passwd 0644

#□□□□□□□□□/opt/test□□

salt '*' file.mkdir /opt/test

#□□□□□□□/etc/httpd/httpd.conf□□□LogLevel□□□warn□□□□info

salt '*' file.sed /etc/httpd/httpd.conf 'LogLevel warn'
'LogLevel info'

#□□□□□□□□/tmp/test/test.conf□□□□□□"maxclient 100"

salt '*' file.append  /tmp/test/test.conf "maxclient 100"

#□□□□□□□□□/tmp/foo□□

salt '*' file.remove /tmp/foo
```

3□API□□□

```
client.cmd□'*'□ ' file.remove '□['/tmp/foo']□
```

□7□iptables□□

1□□□□□□□□iptables□□□

2□□□□

```
#□□□□□□□□□□□append□□□□□insert□iptables□□□□□INPUT□□□□

salt '*' iptables.append filter INPUT rule='-m state --
state RELATED□ESTABLISHED -j ACCEPT'
```

```
salt '*' iptables.insert filter INPUT position=3 rule='-m
state --state RELATED□ESTABLISHED -j ACCEPT'

#□□□□□□□□□□□□□□□□3□position=3□□□□□□□□□

salt '*' iptables.delete filter INPUT position=3

salt '*' iptables.delete filter INPUT rule='-m state --
state RELATED□ESTABLISHED -j ACCEPT'

#□□□□□□□□□□□□□□□□□/etc/sysconfig/iptables□

salt '*' iptables.save /etc/sysconfig/iptables
```

3□API□□□

```
client.cmd□'SN2013-08-022'□ 'iptables.append'□
['filter'□'INPUT'□'rule=\'-p tcp --sport 80 -j ACCEPT\'']□
```

□8□netwrok□□

1□□□□□□□□□□□□□□□

2□□□□

```
#□□□□□□□'SN2013-08-022'□□dig□ping□traceroute□□□□□□

salt 'SN2013-08-022' network.dig www.qq.com

salt 'SN2013-08-022' network.ping www.qq.com

salt 'SN2013-08-022' network.traceroute www.qq.com

#□□□□□□□□'SN2013-08-022'□MAC□□

salt 'SN2013-08-022' network.hwaddr eth0
```

```
#□□□□□□□□'SN2013-08-022'□□□□10.0.0.0/16□□□□□□□□□□True

salt 'SN2013-08-022' network.in_subnet 10.0.0.0/16

#□□□□□□□□'SN2013-08-022'□□□□□□□

salt 'SN2013-08-022' network.interfaces

#□□□□□□□□'SN2013-08-022'□IP□□□□□□

salt 'SN2013-08-022' network.ip_addrs

#□□□□□□□□'SN2013-08-022'□□□□□

salt 'SN2013-08-022' network.subnets
```

3□API□□□

```
client.cmd□'SN2013-08-022'□ 'network.ip_addrs'□
```

□9□pkg□□□□□

1□□□□□□□□□□□□□□□yum□apt-get□□

2□□□□

```
#□□□□□□□□□PHP□□□□□□□□□□□□□□□□□□□□□□□□□□redhat□□□yum□□□□yum
-y install php

salt '*' pkg.install php

#□□□□□□□□□PHP□□

salt '*' pkg.remove php

#□□□□□□□□□□□□
```

```
salt '*' pkg.upgrade
```

3□API□□□

```
client.cmd□'SN2013-08-022'□ 'pkg.remove'□['php']□
```

□10□Service□□□□

1□□□□□□□□□□□□□□□□

2□□□□

```
#□□□enable□□□□□disable□nginx□□□□□□□

salt '*' service.enable nginx

salt '*' service.disable nginx

#□□nginx□□□reload□restart□start□stop□status□□

salt '*' service.reload nginx

salt '*' service.restart nginx

salt '*' service.start nginx

salt '*' service.stop nginx

salt '*' service.status nginx
```

3□API□□□

```
client.cmd（'SN2013-08-022'， 'service.stop'，['nginx']）
```

第11章 [illegible]

10.4 grains[illegible]

grains[illegible]Saltstack[illegible]grains[illegible]CPU[illegible]jinja[illegible]

```
{% if grains['os'] == 'Ubuntu' %}

host[illegible] {{ grains['host'] }}

{% elif grains['os'] == 'CentOS' %}

host[illegible] {{ grains['fqdn'] }}

{% endif %}
```

[illegible]CentOS[illegible]“host[illegible]{{grains['fqdn']}}”[illegible]SN2013-08-022[illegible]centOS 6.4[illegible]“host[illegible]SN2013-08-022”[illegible]CentOS[illegible]-G[illegible]salt-G'os[illegible]CentOS'test.ping[illegible]

10.4.1 grains[illegible]

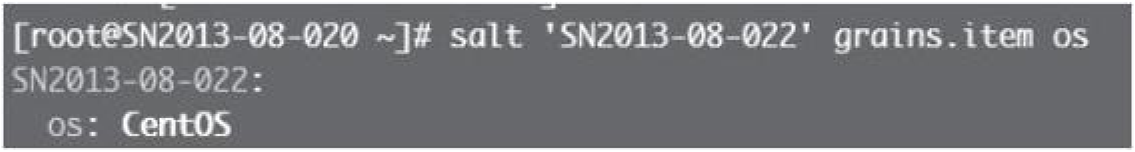
[illegible]2.6.32-358.14.1.el6.x86_64[illegible]

```
salt -G 'kernelrelease[illegible]2.6.32-358.14.1.el6.x86_64' cmd.run
'uname -a'
```

□□□□□□□grains□□□□

```
salt '*' grains.ls
```

□□□□□□□□□□□□grains□□□□□□□□□□□□□□□□□□□□salt'SN2013-08-022'grains.item os□□□□□10-9□□□



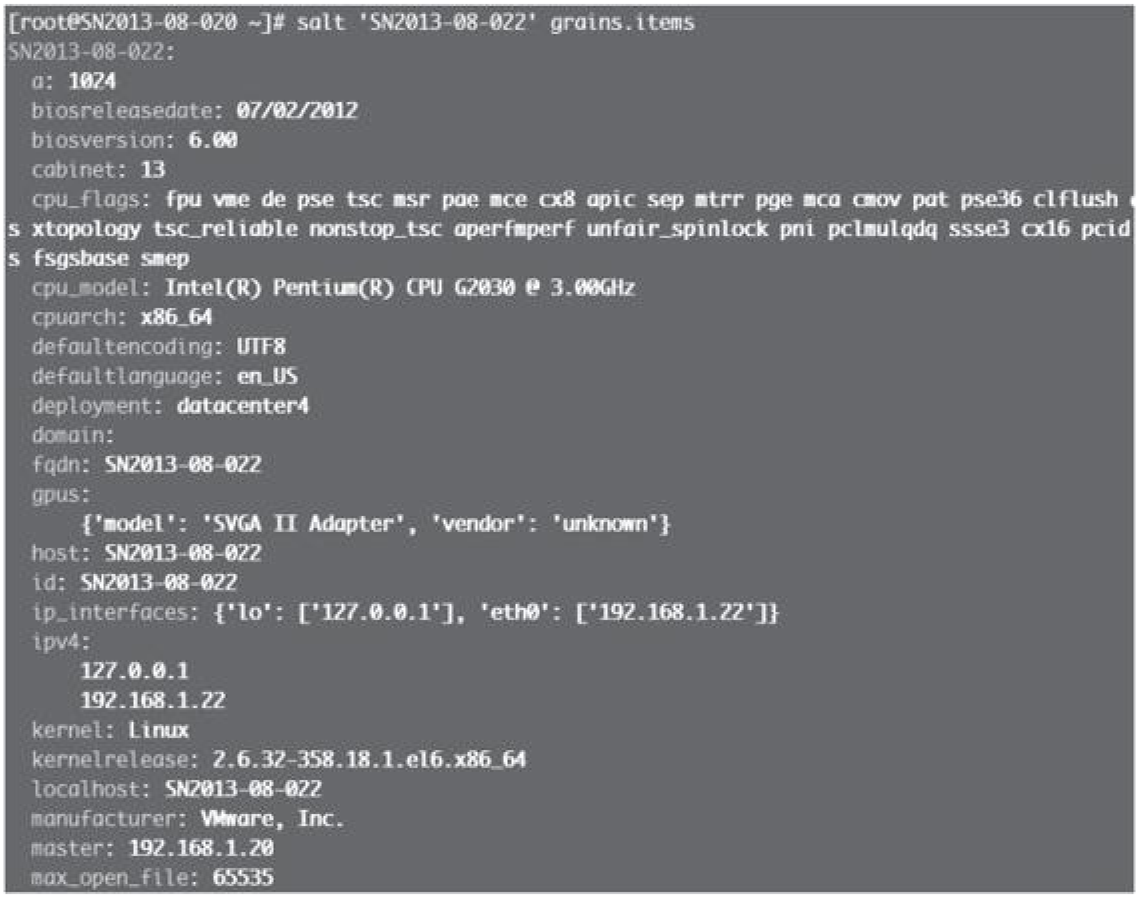
```
[root@SN2013-08-020 ~]# salt 'SN2013-08-022' grains.item os
SN2013-08-022:
  os: CentOS
```

□10-9　□□grains□□□□□□□□□□□□□□

□□□□id□“SN2013-08-022”□□□grains□□□□□□□□□□□□10-10□□□

10.4.2　□□grains□□

□□grains□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□API□□□□□□□□□□□□□□□□Python□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□



```
[root@SN2013-08-020 ~]# salt 'SN2013-08-022' grains.items
SN2013-08-022:
  a: 1024
  biosreleasedate: 07/02/2012
  biosversion: 6.00
  cabinet: 13
  cpu_flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush
s xtopology tsc_reliable nonstop_tsc aperfmperf unfair_spinlock pni pclmulqdq ssse3 cx16 pcid
s fsgsbase smep
  cpu_model: Intel(R) Pentium(R) CPU G2030 @ 3.00GHz
  cpuarch: x86_64
  defaultencoding: UTF8
  defaultlanguage: en_US
  deployment: datacenter4
  domain:
  fqdn: SN2013-08-022
  gpus:
      {'model': 'SVGA II Adapter', 'vendor': 'unknown'}
  host: SN2013-08-022
  id: SN2013-08-022
  ip_interfaces: {'lo': ['127.0.0.1'], 'eth0': ['192.168.1.22']}
  ipv4:
      127.0.0.1
      192.168.1.22
  kernel: Linux
  kernelrelease: 2.6.32-358.18.1.el6.x86_64
  localhost: SN2013-08-022
  manufacturer: VMware, Inc.
  master: 192.168.1.20
  max_open_file: 65535
```

□10-10 □□□□□□grains□□□□□□□□

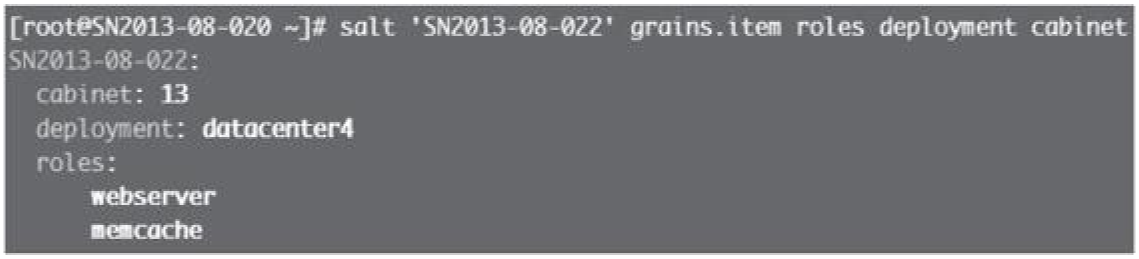
1.□□□□□□□grains□□

SSH□□□□□□□□□□SN2013-08-022□□□□□□□□□□□/etc/salt/minion□□□□default_include□minion.d/*.conf□□□□□□□□

□/etc/salt/minion.d/hostinfo.conf□

```
grains□
  roles□
    - webserver
    - memcache
  deployment□ datacenter4
  cabinet□ 13
```

□□□□□□salt-minion□□□□□□□□service salt-minion restart□□□□□□□□□□□□□□salt'SN2013-08-022'grains.item roles deployment cabinet□□□□□□□□□□□□10-11□□□



```
[root@SN2013-08-020 ~]# salt 'SN2013-08-022' grains.item roles deployment cabinet
SN2013-08-022:
  cabinet: 13
  deployment: datacenter4
  roles:
      webserver
      memcache
```

□10-11　□□grains□□□□

2.□□□□□□□□□grains□□

□□□□□□□□Python□□□□□□□Python□□□□□□□□□□□□□□□□□□□□Python□□□□□□□□pyc□□□□□□bash□□□□/etc/salt/master□□□□□file_roots□□□□□base□□□/srv/salt□□□□_grains□□□□□install-d/srv/salt/_grains□□□□□□□□□□□□□□□□□□□□□□□□□□□ulimit-n□□grains□□□

□/srv/salt/_grains/sysprocess.py□

```
import os□sys□commands

def Grains_openfile□□□

    '''

        return os max open file of grains value

    '''

    grains = {}

    #init default value

    _open_file=65536

    try□

        getulimit=commands.getstatusoutput□'source
/etc/profile□ulimit -n'□

    except Exception□e□

        pass

    if getulimit[0]==0□

        _open_file=int□getulimit[1]□

    grains['max_open_file'] = _open_file

    return grains
```

□□□□□□□□□□

·grains_openfile□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Python□□□□□□□□□□

·grains={}□□□□□grains□□□□□□□□□□grains□□□Saltstack□□□

·grains['max_open_file']=_open_file□□□□Linux ulimit-n□□□□□□grains['max_open_file']□□□“max_open_file”□□grains□□□_open_file□□grains□□□

□□□□□□□□□□□□□□□□□□□□□□grains□□

□□□□salt'SN2013-08-022'saltutil.sync_all□□□“SN2013-08-022”□□□□□□□□□□□□□□□□minion cache□□□□□□□

```
/var/cache/salt/minion/extmods/grains/grains_openfile.py

/var/cache/salt/minion/files/base/_grains/grains_openfile.py
```

/var/cache/salt/minion/extmods/grains/□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□pyc□/var/cache/salt/minion/files/base/_grains/□□□□□□□□

□□□□salt'SN2013-08-022'sys.reload_modules□□□□□□□□□□□□□□□/var/cache/salt/minion/extmods/grains/□□□□□□□□□□□□□□□grains_openfile.pyc□□□□Python□□□□□□□

```
/var/cache/salt/minion/extmods/grains/grains_openfile.py

/var/cache/salt/minion/extmods/grains/grains_openfile.pyc

/var/cache/salt/minion/files/base/_grains/grains_openfile.p
y
```

□□□□□□□□□□□□□grains□□□□□salt'SN2013-08-022'grains.item max_open_file□□□□□“max_open_file□65535”□□□□□□□□□□□grains□□□

```
SN2013-08-022□

  max_open_file□ 65535
```

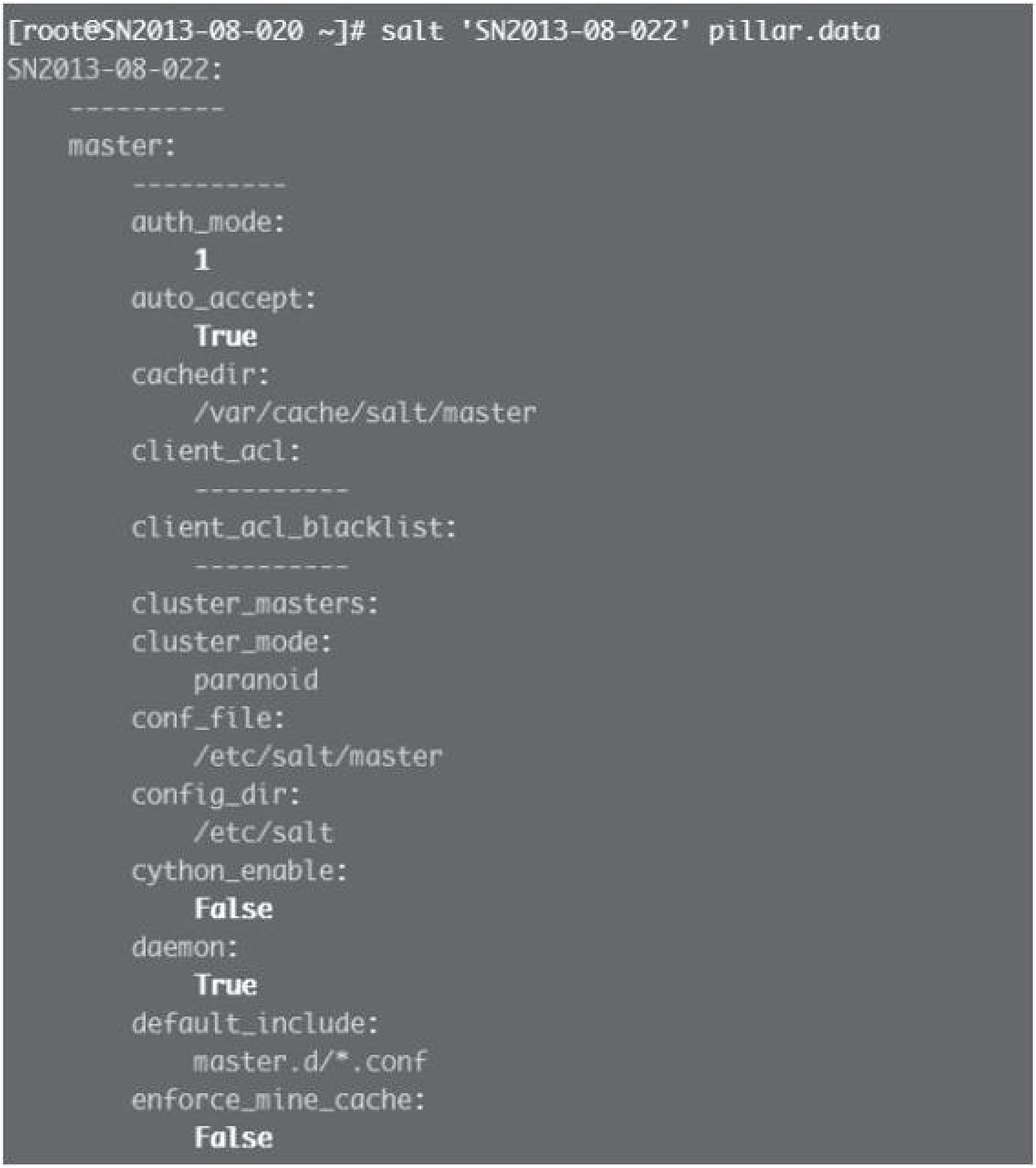
10.5 pillar□□

pillar□□Saltstack□□state□API□□□pillar□□pillar□□□□□□□□□□□□□□□□□□□□□□□□□□grains□□□□□□□□□□□□□□□□□□□□id□□id□□□□□□□□□□□□□□□□□□□□□Python□□□□□□□/□□□□□□□□□□□□□id□□□□□□□□□□□□□□□pillar□□□□□□□

10.5.1 pillar□□□

1.□□□□□□□

Saltstack□□□□□□□□□□□□□□□□□□□□pillar□□□□□□□□□□□□□□□□□□□/etc/salt/master□□□□pillar_opts□Ture□False□□□□□□□□□□□□□□□□□□□□salt'*'pillar.data□□□□□□□10-12□pillar_opts□Ture□□□□□□□□□“SN2013-08-022”□□□□□salt'SN2013-08-022'pillar.data□



```
[root@SN2013-08-020 ~]# salt 'SN2013-08-022' pillar.data
SN2013-08-022:
    ----------
    master:
        ----------
        auth_mode:
            1
        auto_accept:
            True
        cachedir:
            /var/cache/salt/master
        client_acl:
            ----------
        client_acl_blacklist:
            ----------
        cluster_masters:
        cluster_mode:
            paranoid
        conf_file:
            /etc/salt/master
        config_dir:
            /etc/salt
        cython_enable:
            False
        daemon:
            True
        default_include:
            master.d/*.conf
        enforce_mine_cache:
            False
```

□10-12　□□□□pillar□□□□□□□

2.SLS□□□□

pillar□□□sls□□□□□□□□□□□□□YAML□□□□Saltstack□state□□□□□□□□□□□□□□□□□□□□□□□

□□□□□□□□top.sls□□□□□□□□□□□□pillar□□sls□□□□□□□□

□1□□□pillar□□□□

□□□□□□□/etc/salt/master□pillar_roots□□□□□pillar□□□□□□□□□□

```
pillar_roots□

  base□

    - /srv/pillar
```

□□□□pillar□□□□□□□□install-d/srv/pillar□

□2□□□□□□□top.sls

□□□□□□□□□□□□pillar□□□□□□□□□□□□□□□□“*”□□□□□□□□□□□□□□data.sls□□□□□□□□□□

□/srv/pillar/top.sls□

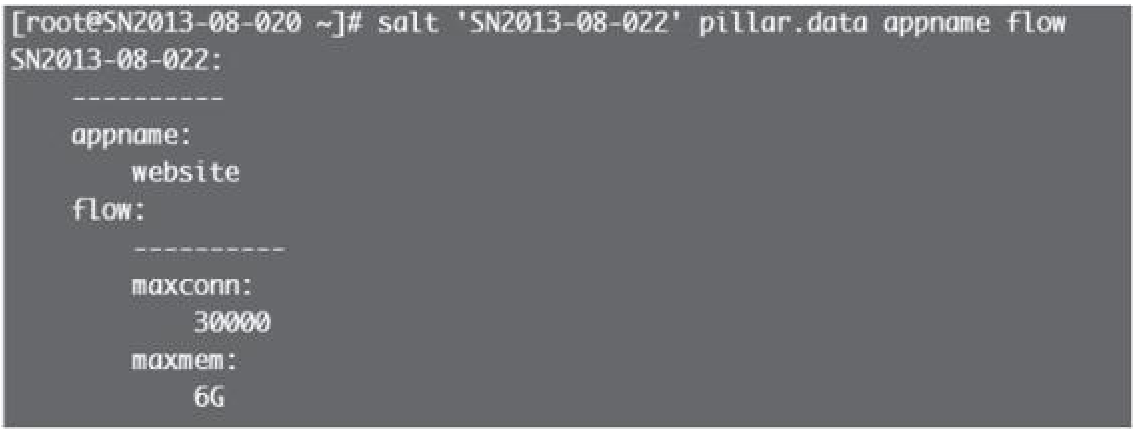
```
base□

  '*'□

    - data
```

□/srv/pillar/data.sls□

```
appname□ website
flow□
  maxconn□ 30000
  maxmem□ 6G
```

□3□□□pillar

□□□□“N2013-08-022”□□□pillar□□□□□□□□□□data.sls□□□□□□□□□□□top.sls□□□“*”□□□□□□□□□□□□□“SN2013-08-022”□pillar□□□□□□□□□□□□□□□□□10-13□□□□□□□□□□□□□□□□□□□□□□□pillar□□□□□salt'*'saltutil.refresh_pillar□□□



```
[root@SN2013-08-020 ~]# salt 'SN2013-08-022' pillar.data appname flow
SN2013-08-022:
    ----------
    appname:
        website
    flow:
        ----------
        maxconn:
            30000
        maxmem:
            6G
```

□10-13 □□□□pillar□□□

10.5.2 pillar□□□

□□pillar□□□□□□□□□□□□□□□□□□□state□□□□□□□□□□□□□□“{{pillar□□}}”□□□□

```
{{ pillar['appname'] }}□□□□□

{{ pillar['flow']['maxconn'] }}□□□□□□{{ salt['pillar.get']
□'flow□ 'maxconn'□ {}□ }}
```

Python API□□□□□

```
pillar['flow']['maxconn']

pillar.get□' flow□appname'□ {}□
```

1.□□□□□□

□10.5.1□□□□-I□□□□□pillar□□□□□□□□

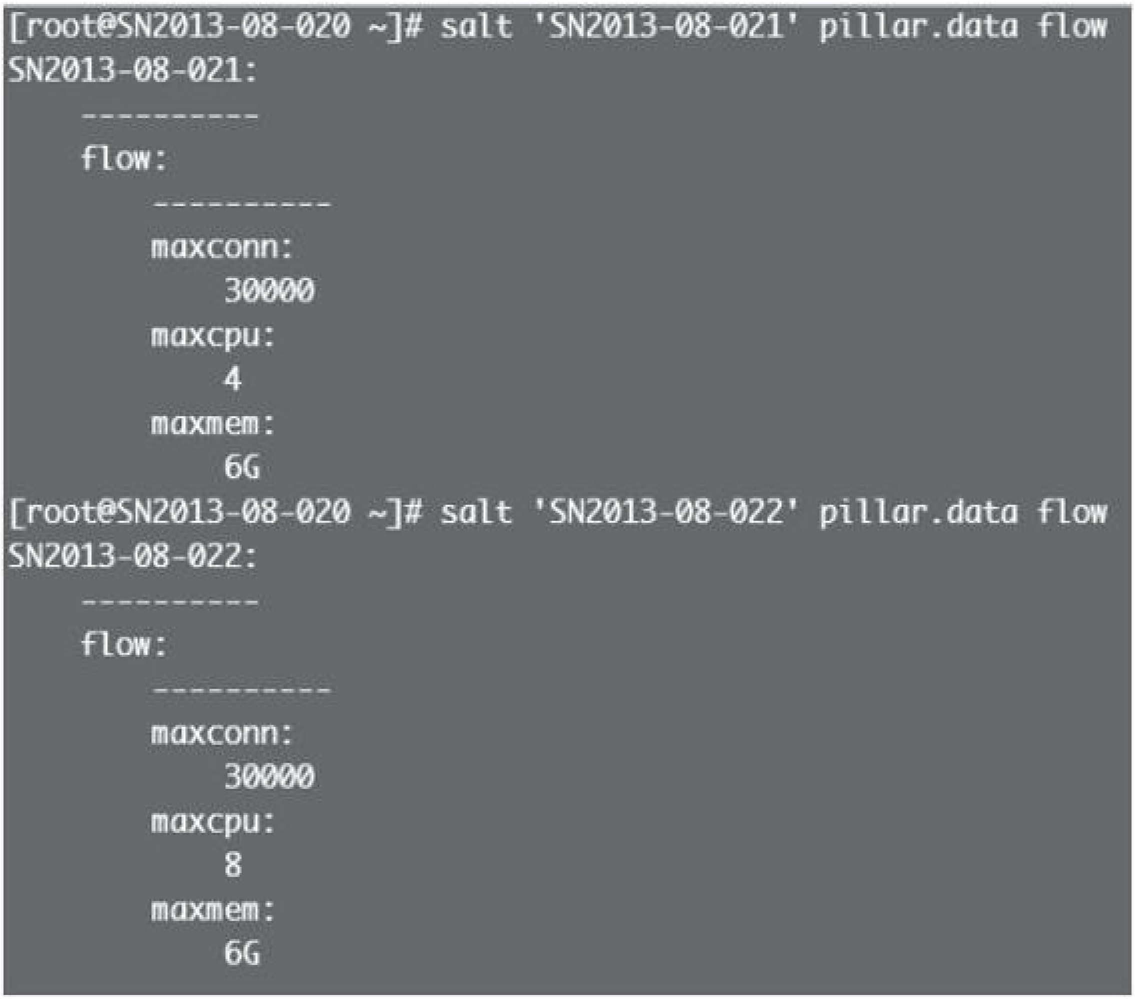
```
# salt -I 'appname□website' test.ping

SN2013-08-021□

    True

SN2013-08-022□

    True
```

2.□□grains□□□□□□□□

□□□□□□grains□id□□□□□□□id□maxcpu□□□□□□□□□□□□□□□□□□□“10.5.1 pillar□□□”□□□□□data.sls□□□□□□□□□□□“if...else...endfi”□jinja2□□□□□□□□□□□□□jinja2□□□□□□□□□□http://jinja.pocoo.org/docs/templates/□

```
appname□ website

flow□

  maxconn□ 30000

  maxmem□ 6G

{% if grains['id'] == 'SN2013-08-022' %}

  maxcpu□ 8

{% else %}

  maxcpu□ 4

{% endif %}
```

□□□□□□□□□pillar□□□□□□□maxcpu□□□□□□10-14□□□



```
[root@SN2013-08-020 ~]# salt 'SN2013-08-021' pillar.data flow
SN2013-08-021:
    ----------
    flow:
        ----------
        maxconn:
            30000
        maxcpu:
            4
        maxmem:
            6G
[root@SN2013-08-020 ~]# salt 'SN2013-08-022' pillar.data flow
SN2013-08-022:
    ----------
    flow:
        ----------
        maxconn:
            30000
        maxcpu:
            8
        maxmem:
            6G
```

□10-14　□□□□□□□pillar□□□□

10.6 state□□

state□Saltstack□□□□□□□□□□□□□□□sls□salt state file□□□□□□□□□□□□□□□□□□□□□□□pkg□□□□□file□□□□□□□network□□□□□□□service□□□□□□□user□□□□□□□□□□http://docs.saltstack.com/ref/states/all/index.html□

10.6.1 state□□□

state□□□□□□sls□□□□□□□□□□YAML□□□□□□□□□□□

```
$ID□

    $State□

        - $state□ states
```

□□□

·$ID□□□state□□□□□□□□□□□□□□□□□□□□□□□apache□nginx□□

·$State□□□□□□□□□□□□http://docs.saltstack.com/ref/states/all/index.html□

·$state□states□□□□□□□□□

□□□□□□□□□□

```
1 apache□
2   pkg□
3     - installed
4   service□
5     - running
6     - require□
7     - pkg□ apache
```

□□□□□□apache□□□□□□□□□□□□□□□□□□□□yum□apt□□□□□□□□□apache□□□□□□□□□□□□□□□□□□□□

□1□□□□□state□□□□□□□□apache□□□□□□□□□□□□□□□

□2□□□4□□□state□□□□□□□□pkg□service□□□□□□□□pkg□□□□□□□□□□□□□□yum□apt□□□□□□□□□□□service□□□□□□□□□

□3□□□5□□□□□□□□□□□□□□□□apache□□

□6□□□□□require□□□□□apache□□□□□□□□□□□□□□□□□□

□□ require□□□□□state□□□□□□□□state□□□□□□□□□□state□□□□□watch□□□□□□state□□□□□□□□□□□

10.6.2 state□□□

state□□□□□□pillar□□□□□□□□□top.sls□□state□□sls□□□□□□□saltstack base□□□□□□□□□□/srv/salt□state□□□□.sls□□jinjia□□□grains□pillar□□□□□state□□□□□□□□□□□□□□salt'*'state.highstate□□□□□□□□□10.5.1□□□□□□□□□grains□pillar□□□□□□□□□□□□□□□□□apache□□□□□□

1.□□pillar

□/srv/pillar/top.sls□

```
base□
  '*'□
    - apache
```

□top.sls□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□apache.sls□□□□□□□apache□□□□□□□□□□init.sls□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□state□top.sls□□□□□□□□

```
#mkidr /srv/pillar/apache    #□□apache□□
```

□/srv/pillar/apache/init.sls□

```
pkgs□
{% if grains['os_family'] == 'Debian' %}
  apache□ apache2
  {% elif grains['os_family'] == 'RedHat' %}
  apache□ httpd
  {% elif grains['os'] == 'Arch' %}
  apache□ apache
{% endif %}
```

□□pillar□□□□□salt'*'pillar.data pkgs□□□□□□□□□□□□□□□□□□

```
SN2013-08-021□
    ----------
    pkgs□
```

```
----------
apache□
    httpd
```

2.□□state

□/srv/salt/top.sls□

```
base□
  '*'□
    - apache
```

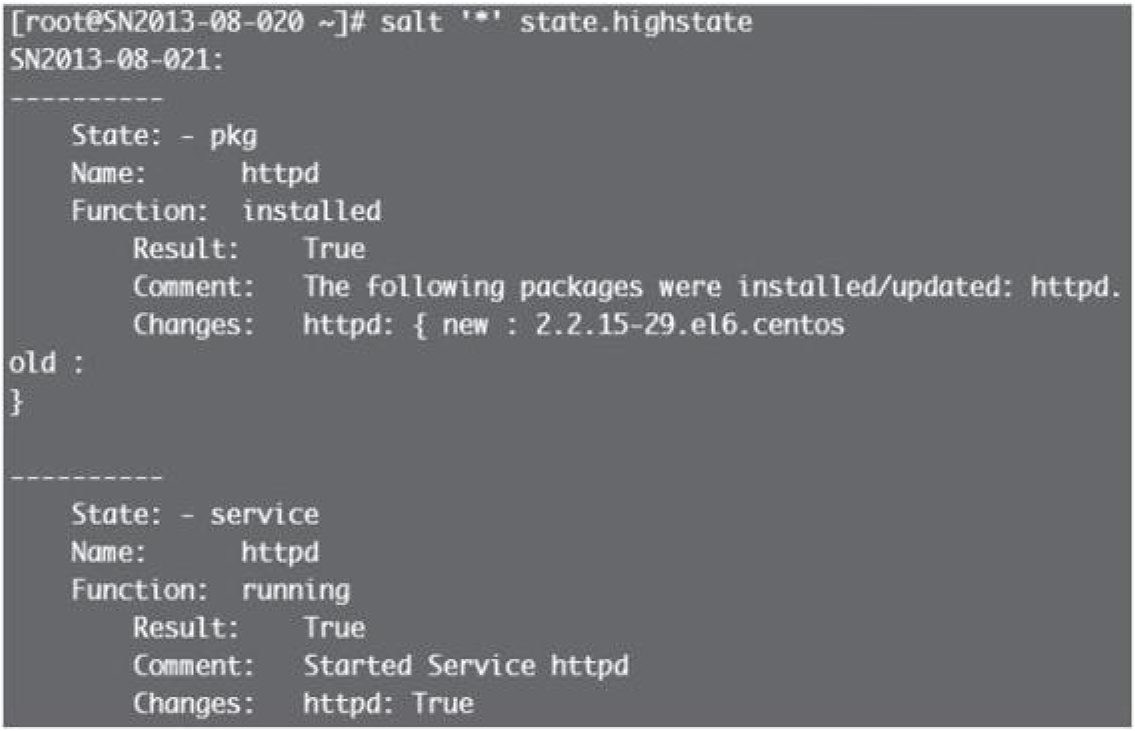
□/srv/salt/apache/init.sls□

```
apache□
   pkg□
     - installed
     - name□ {{ pillar['pkgs']['apache'] }}
   service.running□
     - name□ {{ pillar['pkgs']['apache'] }}
     - require□
       - pkg□ {{ pillar['pkgs']['apache'] }}
```

□□□□□{{pillar['pkgs']['apache']}}□□□□□□□□□□□□□□□□pillar□□□□□□□□□CentOS□□□□□□httpd□□□□□□□□□□□□□□□□□□□□□□□yum–y install httpd□□□□□□apache□□□□□□□□□□□□□□□/etc/init.d/httpd start□□

3.□□state

□□state□□□□□□□□□10-15□



```
[root@SN2013-08-020 ~]# salt '*' state.highstate
SN2013-08-021:
----------
    State: - pkg
    Name:      httpd
    Function:  installed
        Result:    True
        Comment:   The following packages were installed/updated: httpd.
        Changes:   httpd: { new : 2.2.15-29.el6.centos
old :
}

----------
    State: - service
    Name:      httpd
    Function:  running
        Result:    True
        Comment:   Started Service httpd
        Changes:   httpd: True
```

□10-15　□□state□□□□□

□□10-15□□□□□□□□□□□□□□□□□□□□□□□pkg□service□□□□□□□□□□□apache 2.2.15□□□□□□□□

10.7 □□□□□Saltstack□□□□□□□□□□

□□□□□□□□□□□Nginx□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Nginx□□□□□□□□□□□Saltstack□grains□grains_module□pillar□state□jinja□template□□□□□

10.7.1 □□□□

□□□□□10-1□□□□□□□□□□□

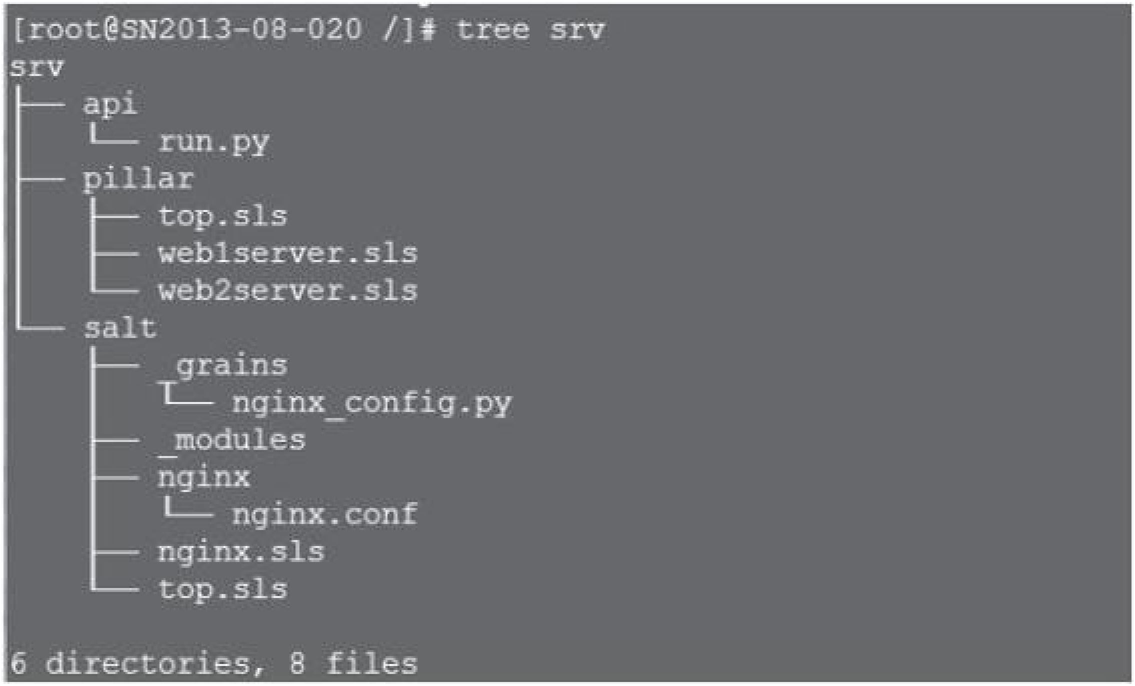
10.7.2 □□□□□□□

master□□□□□□□□□□□□□□

□/etc/salt/master□□□□□□□

```
nodegroups□

   web1group□ 'L@SN2012-07-010□SN2012-07-011□SN2012-07-
012'

   web2group□ 'L@SN2013-08-021□SN2013-08-022'

file_roots□

  base□

    - /srv/salt

pillar_roots□

  base□

    - /srv/pillar
```

[illegible]pillar[illegible]module api[illegible]state[illegible]10-16[illegible]



```
[root@SN2013-08-020 /]# tree srv
srv
├── api
│   └── run.py
├── pillar
│   ├── top.sls
│   ├── web1server.sls
│   └── web2server.sls
└── salt
    ├── _grains
    │   └── nginx_config.py
    ├── _modules
    ├── nginx
    │   └── nginx.conf
    ├── nginx.sls
    └── top.sls

6 directories, 8 files
```

[illegible]10-16 [illegible]

[illegible]Python[illegible]grains_module[illegible]grains[illegible]max_open_file[illegible]ulimit–n[illegible]Nginx.conf[illegible]worker_rlimit_nofile[illegible]worker_connections[illegible]

```
import os[illegible]sys[illegible]commands

def NginxGrains[illegible]

    '''

        return Nginx config grains value
    '''
    grains = {}
    max_open_file=65536
    try□
        getulimit=commands.getstatusoutput□'source
/etc/profile□ulimit -n'□
    except Exception□e□
        pass
    if getulimit[0]==0□
        max_open_file=int□getulimit[1]□
    grains['max_open_file'] = max_open_file
    return grains
```

□□□□“10.4.2□□Grains□□”□“□□□□□□□□Grains□□”

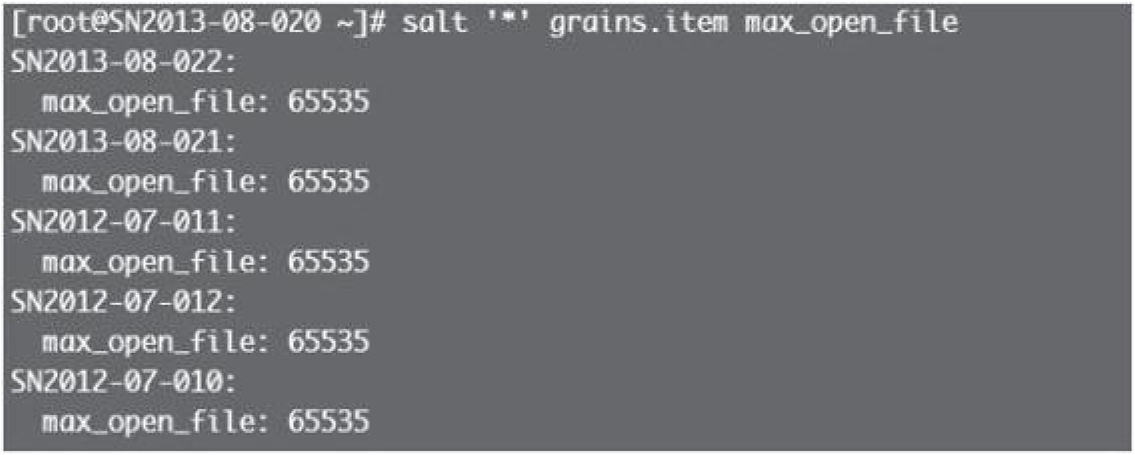
□□grains□□□□□

```
# salt '*' saltutil.sync_all
```

□□□□□minion□□□□□□□□

```
# salt '*' sys.reload_modules
```

□□max_open_file key□key□□□□□10-17□



```
[root@SN2013-08-020 ~]# salt '*' grains.item max_open_file
SN2013-08-022:
  max_open_file: 65535
SN2013-08-021:
  max_open_file: 65535
SN2012-07-011:
  max_open_file: 65535
SN2012-07-012:
  max_open_file: 65535
SN2012-07-010:
  max_open_file: 65535
```

□10-17 □□max_open_file key□key□□

10.7.3 □□pillar

□□□□□□□□□□□pillar□□□□□□□□□□□sls□□□□□match□□□□□□□□□□□□□□nodegroup□□□□□grain□pillar□□□□□□□□□grain□□□□□□□□□

```
 dev□

   'os□Debian'□

     - match□ grain

     - servers
```

□□□□□/etc/salt/master□□□□□□□□□□web1group□web2group□□□□□□□□□web1server.sls□web1server.sls□□□/srv/pillar/top.sls□□□□□

□/srv/pillar/top.sls□

```
base□
  web1group□
    - match□ nodegroup
    - web1server
  web2group□
    - match□ nodegroup
    - web2server
```

□□□□□□□□□□□□pillar□□□web_root□□□□□□□□□□□□□□□□□□□□□□□□python□□□□□"key□ value"□

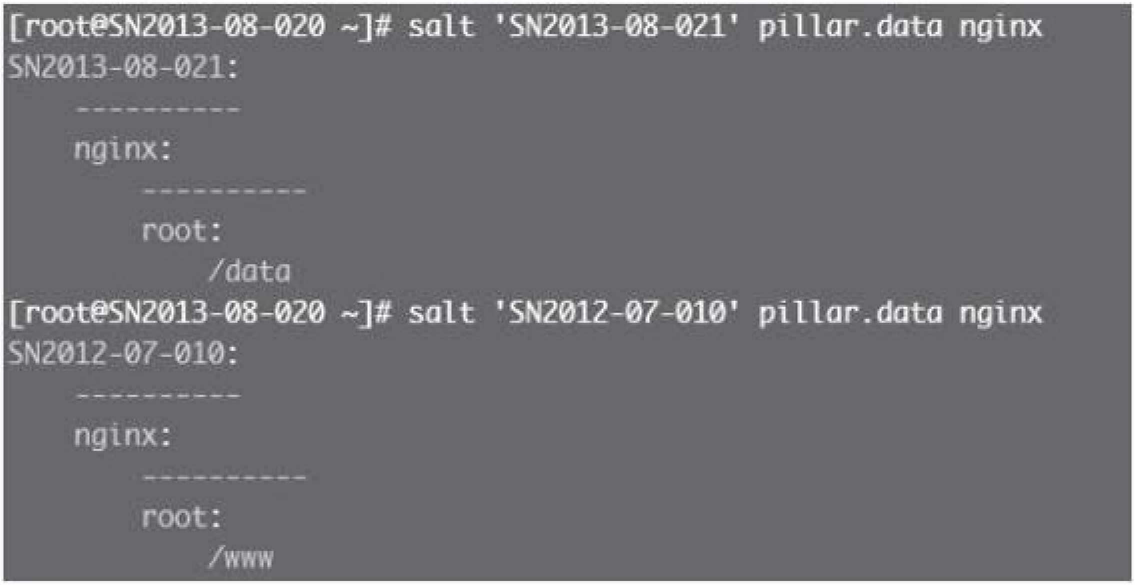
□/srv/pillar/web1server.sls□

```
nginx□
    root□ /www
```

□/srv/pillar/web2server.sls□

```
nginx□
    root□ /data
```

□□□□□□□□□□□pillar□□□□□□□□□□□□10-18□□□



```
[root@SN2013-08-020 ~]# salt 'SN2013-08-021' pillar.data nginx
SN2013-08-021:
    ----------
    nginx:
        ----------
        root:
            /data
[root@SN2013-08-020 ~]# salt 'SN2012-07-010' pillar.data nginx
SN2012-07-010:
    ----------
    nginx:
        ----------
        root:
            /www
```

□10-18　□□□□□pillar□□□□

10.7.4　□□state

□□□□top.sls□

□/srv/salt/top.sls□

```
base□
  '*'□
    - nginx
```

□□□□nginx□□□□□□□□□□sls□□□□salt□//nginx/nginx.conf□□□□□□□□□□-enable□True□□□□□□□□□□□□□□□□□□□□□□□□□□□□□chkconfig nginx on□□“reload□True”□□□□□□□reload□□□□□□□□□□□restart□□□watch

□□□□/etc/nginx/nginx.conf□□□□□□□□□□□nginx□□□□□□

□/srv/salt/nginx.sls□

```
nginx□
  pkg□
   - installed
  file.managed□
   - source□ salt□//nginx/nginx.conf
   - name□ /etc/nginx/nginx.conf
   - user□ root
   - group□ root
   - mode□ 644
   - template□ jinja
  service.running□
   - enable□ True
   - reload□ True
   - watch□
     - file□ /etc/nginx/nginx.conf
     - pkg□ nginx
```

□□Nginx□□□□jinja□□□□□□□□□□□□□□

·worker_processes□□□□grains['num_cpus']□□□□□□□CPU□□□□□□

·worker_cpu_affinity□□□□CPU□□□□□□□□□□□□□□□□□2□4□8□□□□□□

·worker_rlimit_nofile□worker_connections□□□□□□grains['max_open_file']□

·root□□□□□□pillar['nginx']['root']□□

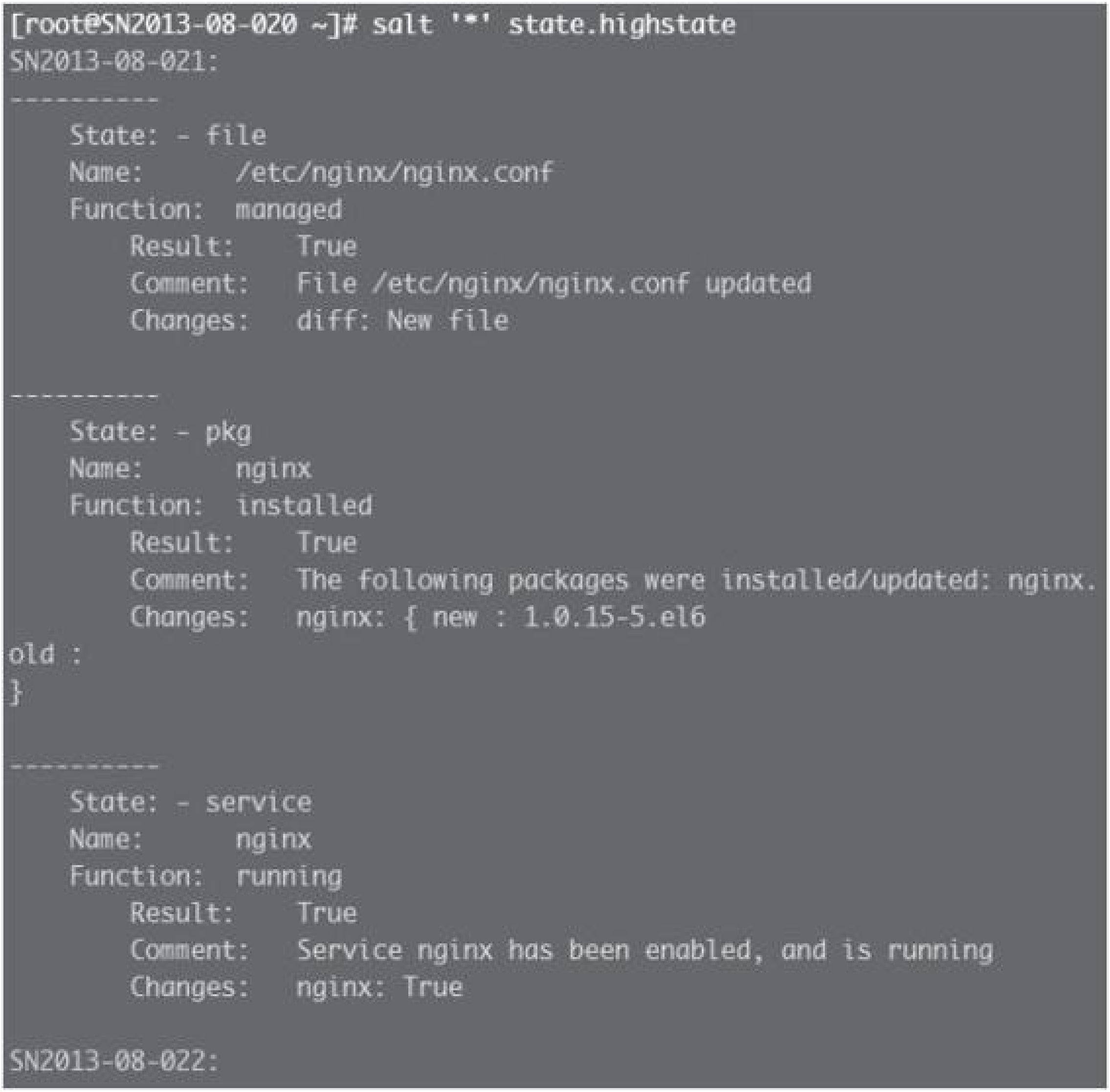
□/srv/salt/nginx/nginx.conf□

```
# For more information on configuration□ see□

user              nginx□

worker_processes  {{ grains['num_cpus'] }}□

{% if grains['num_cpus'] == 2 %}

worker_cpu_affinity 01 10□

{% elif grains['num_cpus'] == 4 %}

worker_cpu_affinity 1000 0100 0010 0001□

{% elif grains['num_cpus'] >= 8 %}

worker_cpu_affinity 00000001 00000010 00000100 00001000
00010000 00100000 01000000 10000000□

{% else %}

worker_cpu_affinity 1000 0100 0010 0001□

{% endif %}
```

```
worker_rlimit_nofile {{ grains['max_open_file'] }}□

error_log  /var/log/nginx/error.log□

#error_log  /var/log/nginx/error.log  notice□

#error_log  /var/log/nginx/error.log  info□

pid        /var/run/nginx.pid□

events {

    worker_connections  {{ grains['max_open_file'] }}□

}

http {

    include       /etc/nginx/mime.types□

    default_type  application/octet-stream□

    log_format  main  '$remote_addr - $remote_user [$time_local] "$request" '

                      '$status $body_bytes_sent "$http_referer" '

                      '"$http_user_agent" "$http_x_forwarded_for"'□

    access_log  /var/log/nginx/access.log  main□

    sendfile        on□

    #tcp_nopush     on□

    #keepalive_timeout  0□

    keepalive_timeout  65□

    #gzip  on□

    # Load config files from the /etc/nginx/conf.d directory
    # The default server is in conf.d/default.conf
    #include /etc/nginx/conf.d/*.conf；
    server {
        listen       80 default_server；
        server_name  _；
        #charset koi8-r；
        #access_log  logs/host.access.log  main；
        location / {
            root   {{ pillar['nginx']['root'] }}；
            index  index.html index.htm；
        }
        error_page  404              /404.html；
        location = /404.html {
            root   /usr/share/nginx/html；
        }
        # redirect server error pages to the static page /50x.html
        #
        error_page   500 502 503 504  /50x.html；
        location = /50x.html {
            root   /usr/share/nginx/html；
        }
    }
```

```
}
```

□□□□state□□□□□□□10-19□□□



```
[root@SN2013-08-020 ~]# salt '*' state.highstate
SN2013-08-021:
----------
    State: - file
    Name:      /etc/nginx/nginx.conf
    Function:  managed
        Result:    True
        Comment:   File /etc/nginx/nginx.conf updated
        Changes:   diff: New file


----------
    State: - pkg
    Name:      nginx
    Function:  installed
        Result:    True
        Comment:   The following packages were installed/updated: nginx.
        Changes:   nginx: { new : 1.0.15-5.el6
old :
}

----------
    State: - service
    Name:      nginx
    Function:  running
        Result:    True
        Comment:   Service nginx has been enabled, and is running
        Changes:   nginx: True

SN2013-08-022:
```

□10-19 □□state□□□□□□□□□

10.7.5 □□□□

□□web1group□□□□□□□□□□Nginx□□□□□□□□□
□□□□□□□□□□□□□□

□/etc/nginx/nginx.conf□

```
user              nginx□
worker_processes  2□
worker_cpu_affinity 01 10□
worker_rlimit_nofile 65535□
error_log  /var/log/nginx/error.log□
#error_log  /var/log/nginx/error.log  notice□
#error_log  /var/log/nginx/error.log  info□
pid        /var/run/nginx.pid□
events {
    worker_connections  65535□
}
……
        location / {
            root   /www□
            index  index.html index.htm□
        }
```

□□□web2group□□□□□□□□□□Nginx□□□□□□
web1group□□□□□□□□□□□□□□□□□□□□□□□□□□

□□□□□

□/etc/nginx/nginx.conf□

```
user              nginx□
worker_processes  4□
worker_cpu_affinity 1000 0100 0010 0001□
worker_rlimit_nofile 65535□
error_log  /var/log/nginx/error.log□
#error_log  /var/log/nginx/error.log  notice□
#error_log  /var/log/nginx/error.log  info□
pid        /var/run/nginx.pid□
events {
    worker_connections  65535□
}
……
        location / {
            root   /data□
            index  index.html index.htm□
        }
```

□□□□□□□□□□□Web□□□

[illegible]11[illegible] [illegible]Func[illegible]

Func[illegible]Fedora Unified Network Controller[illegible]Fedora[illegible]https://fedorahosted.org/func[illegible]Func[illegible]master[illegible]slave[illegible]master[illegible]slave[illegible]Func[illegible]

·[illegible]

·[illegible]

·Func[illegible]XMLRPC[illegible]SSL[illegible]Saltstack[illegible]

·[illegible]Kickstart[illegible]Func[illegible]

·[illegible]Func[illegible]Python API[illegible]Func[illegible]API[illegible]

·[illegible]

·Func[illegible]

Func[illegible]Saltstack[illegible]+[illegible]Saltstack[illegible]Ansible[illegible]Func[illegible]API[illegible]API[illegible]

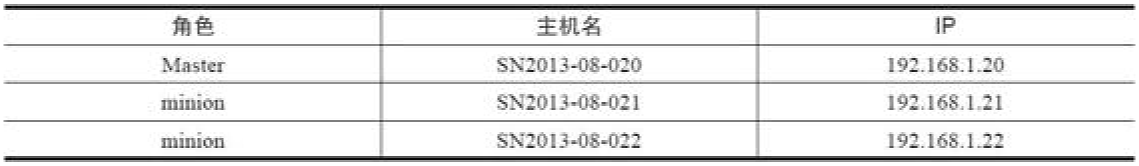
11.1 Func[illegible]

Func[illegible]yum[illegible]Func[illegible]0.28[illegible]func[illegible]certmaster[illegible]pyOpenSSL[illegible]Func[illegible]

11.1.1 [illegible]

[illegible]CentOS release 6.4[illegible]Python 2.6.6[illegible]11-1[illegible]

[illegible]11-1 [illegible]



角色	主机名	IP
Master	SN2013-08-020	192.168.1.20
minion	SN2013-08-021	192.168.1.21
minion	SN2013-08-022	192.168.1.22

11.1.2 [illegible]Func

1.[illegible]

[illegible]SN2013-08-020[illegible]yum[illegible]

```
# yum install func –y

# /sbin/chkconfig --level 345 certmaster on
```

[illegible]Func[illegible]hosts[illegible]hosts[illegible]

[illegible]/etc/hosts[illegible]

```
192.168.1.21    SN2013-08-021

192.168.1.22    SN2013-08-022

192.168.1.20    func.master.server.com
```

[illegible]/etc/certmaster/minion.conf[illegible]certmaster[illegible]func[illegible]

[illegible]/etc/certmaster/minion.conf[illegible]

```
# configuration for minions

[main]

certmaster = func.master.server.com

certmaster_port = 51235

log_level = DEBUG

cert_dir = /etc/pki/certmaster
```

[illegible]

```
# /sbin/service certmaster start
```

□□iptables□□□192.168.1.0/24□□□□□□□□51235□certmaster□□□□□□

```
# iptables -I INPUT -s 192.168.1.0/24 -p tcp --dport 51235
-j ACCEPT
```

□□□□□□□□□□□

2.□□□□□□□□

□□□□□□□□□□SN2013-08-021□SN2013-08-022□□□□□□□□□yum□□□□□□□□

```
# yum install func –y

# /sbin/chkconfig --level 345 funcd on
```

□□hosts□□□

```
192.168.1.20    func.master.server.com
```

□□/etc/certmaster/minion.conf□certmaster□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/etc/certmaster/minion.conf□

```
# configuration for minions

[main]

certmaster = func.master.server.com

certmaster_port = 51235

log_level = DEBUG

cert_dir = /etc/pki/certmaster
```

□□/etc/func/minion.conf□minion_name□□□□□□□□□□□□□□□□□□□□□□□□SN2013-08-021□□□□□□□□□□

```
# configuration for minions

[main]

log_level = INFO

acl_dir = /etc/func/minion-acl.d

listen_addr =

listen_port = 51234

minion_name = SN2013-08-021

method_log_dir = /var/log/func/methods/
```

□□func□□□

```
# /sbin/service funcd start
```

[illegible]iptables[illegible]192.168.1.20[illegible]51234[illegible]func[illegible]

```
# iptables -I INPUT -s 192.168.1.20 -p tcp --dport 51234 -j
ACCEPT
```

[illegible]

3.[illegible]

[illegible]certmaster-ca--list[illegible]

```
# certmaster-ca --list

sn2013-08-021

sn2013-08-022
```

[illegible]certmaster-ca--sign hostname[illegible]

```
# certmaster-ca --sign sn2013-08-021
```

[illegible]--list[illegible]--sign[illegible]

```
# certmaster-ca --sign `certmaster-ca --list`
```

Func□□□□□□Saltstack□□□□□□□□□□□□/etc/certmaster/certmaster.conf□□□autosign=no□autosign=yes□□□

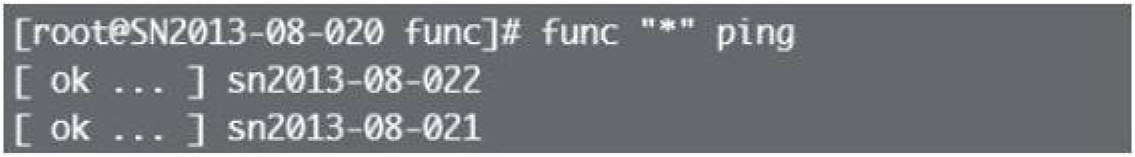
□□func"*"list_minions□□□□□□□□□□□□□□□

```
# func '*' list_minions

sn2013-08-021

sn2013-08-022
```

□□□□□□□□□□□□certmaster-ca-c hostname□□□

```
# certmaster-ca -c sn2013-08-021
```

□□□□□□□□□□□□□□□□func"*"ping□□□□□□□□11-1□□□



```
[root@SN2013-08-020 func]# func "*" ping
[ ok ... ] sn2013-08-022
[ ok ... ] sn2013-08-021
```

□11-1　□□□□□□□□□□

□□ □□□□□□□□□□□□□□□□□□□□□□□□□/etc/pki/certmaster/□□□□□□□□□3□certmaster-request□□□□□□□□□□□□□□□□

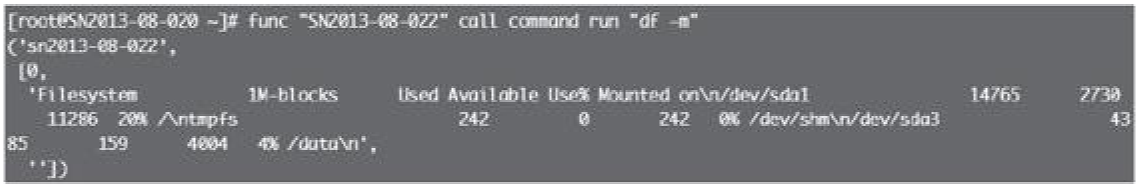
```
# rm -rf /etc/pki/certmaster/□□□.*

# /usr/bin/certmaster-request
```

11.2 Func[illegible]API

Func[illegible]CommandModule[illegible]CopyFileModule[illegible]CpuModule[illegible]CPU[illegible]DiskModule[illegible]FileTrackerModule[illegible]IPtablesModule[illegible]iptables[illegible]MountModule[illegible]Mount[illegible]NagiosServerModule[illegible]Nagios[illegible]NetworkTest[illegible]ProcessModule[illegible]SysctlModule[illegible]sysctl[illegible]SNMPModule[illegible]SNMP[illegible]https://fedorahosted.org/func/wiki/ModulesList[illegible]

func<[illegible]>call<module_name[illegible]><method_name[illegible]><module_args[illegible]>

[illegible]Python[illegible]API[illegible]“df-m”[illegible]11-2[illegible]



```
[root@SN2013-08-020 ~]# func "SN2013-08-022" call command run "df -m"
('sn2013-08-022',
 [0,
  'Filesystem            1M-blocks      Used Available Use% Mounted on\n/dev/sda1              14765      2730
    11286  20% /\ntmpfs                     242         0       242   0% /dev/shm\n/dev/sda3               43
85       159      4004   4% /data\n',
  ''])
```

[illegible]11-2 [illegible]

[illegible]CommandModule[illegible]API[illegible]Func[illegible]

11.2.1 [illegible]

Func[illegible]“*”[illegible]“[illegible]”[illegible]“*”[illegible]“[illegible]”[illegible]

```
# func "SN2013-*-02[illegible]" call command run "uptime"
```

“SN2013-*-02[illegible]”[illegible]SN2013-08-021[illegible]SN2013-08-022[illegible]Web[illegible]web1[illegible]web2[illegible]web3[illegible]…[illegible]webn.webapp.com[illegible]Web[illegible]uptime[illegible]

```
# func "web*.webapp.com" call command run "uptime"
```

[illegible]

```
# func "web.example.org[illegible]mailserver.example.org[illegible]
db.example.org" call command run "df -m"
```

11.2.2 [illegible]

1.[illegible]

[illegible]1[illegible]

CommandModule[illegible]Linux[illegible]

[illegible]2[illegible]

```
# func "*" call command run "ulimit -a"

# func "SN2013-08-022" call command run "free -m"
```

[illegible]3[illegible]API[illegible]

```
import func.overlord.client as func

client = func.Client[illegible]"SN2013-08-022"[illegible]

print client.command.run[illegible]"free -m"[illegible]
```

2.[illegible]

[illegible]1[illegible]

CopyFileModule[illegible]scp[illegible]

[illegible]2[illegible]

```
# func "SN2013-08-022" copyfile -f /etc/sysctl.conf --
remotepath /etc/sysctl.conf
```

□3□API□□

```
import func.overlord.client as func

client = func.Client□"SN2013-08-022"□

client.local.copyfile.send
□"/etc/sysctl.conf"□"/tmp/sysctl.conf"□
```

3.CPU□□□□

□1□□□

CpuModule□□□□□□CPU□□□□□□□□□□□□□□□□□□□□□□□□□□“10”□

□2□□□□□□

```
# func "SN2013-08-022" call cpu usage

# func "SN2013-08-022" call cpu usage 10
```

□3□API□□

```
import func.overlord.client as func

client = func.Client□"SN2013-08-022"□

print client.cpu.usage□10□
```

4.[illegible]

[illegible]1[illegible]

DiskModule[illegible]/data[illegible]

[illegible]2[illegible]

```
# func "SN2013-08-022" call disk usage

# func "SN2013-08-022" call disk usage /data
```

[illegible]3[illegible]API[illegible]

```
import func.overlord.client as func

client = func.Client[illegible]"SN2013-08-022"[illegible]

print  client.disk.usage[illegible]"/dev/sda3"[illegible]
```

5.[illegible]

[illegible]1[illegible]

GetFileModule[illegible]Linux[illegible]

[illegible]2[illegible]API[illegible]

```
import func.overlord.client as func

client = func.Client□"SN2013-08-022"□

client.local.getfile.get□"/etc/sysctl.conf"□"/tmp/"□
```

6.iptables□□□□

□1□□□

IPtablesModule□□□□□□iptables□□□

□2□□□□□□

```
# func "SN2013-08-022" call iptables.port drop_to 53
192.168.0.0/24 udp src

# func "SN2013-08-022" call iptables drop_from 192.168.0.10
```

□3□API□□

```
import func.overlord.client as func

client = func.Client□"SN2013-08-022"□

client.iptables.port.drop_to□8080□ "192.168.0.10"□ "tcp"□
"dst"□
```

7.□□□□□□□□

□1□□□

HardwareModule□□□□□□□□□□□□□

□2□□□□□

```
# func "SN2013-08-022" call hardware info

# func "SN2013-08-022" call hardware hal_info
```

□3□API□□

```
import func.overlord.client as func

client = func.Client□"SN2013-08-022"□

print client.hardware.info□with_devices=True□

print client.hardware.hal_info□□
```

8.□□Mount□□□□

□1□□□

MountModule□□□□□□Linux□□□□□□□□□□□□

□2□□□□□

```
# func "SN2013-08-022" call mount list

# func "SN2013-08-022" call mount mount /dev/sda3 /data

#  func "SN2013-08-022" call mount umount "/data"
```

□3□API□□

```
import func.overlord.client as func

client = func.Client□"SN2013-08-022"□

print client.mount.list□□

print client.mount.umount□"/data"□

print client.mount.mount□"/dev/sda3"□"/data"□
```

9.□□□□□□□□

□1□□□

ProcessModule□□□□Linux□□□□□□□

□2□□□□□□

```
# func "SN2013-08-022" call process info "aux"

# func "SN2013-08-022" call process pkill nginx -9

# func "SN2013-08-022" call process kill nginx SIGHUP
```

□3□API□□

```
import func.overlord.client as func

client = func.Client□"SN2013-08-022"□

print client.process.info□"aux"□
print client.process.pkill□"nginx"□ "-9"□

print client.process.kill□"nginx"□ "SIGHUP"□
```

10.□□□□□□□□

□1□□□

ServiceModule□□□□Linux□□□□□□□□□

□2□□□□□□

```
# func "SN2013-08-022" call service start nginx
```

□3□API□□

```
import func.overlord.client as func

client = func.Client□"SN2013-08-022"□

print client.service.start□"nginx"□
```

11.□□□□□□□□□□

□1□□□

SysctlModule□□□□Linux□□□□□□□□□□□

□2□□□□□□

```
# func "SN2013-08-022" call sysctl list

# func "SN2013-08-022" call sysctl get net.nf_conntrack_max

# func "SN2013-08-022" call sysctl set net.nf_conntrack_max
15449
```

□3□API□□

```
import func.overlord.client as func

client = func.Client□"SN2013-08-022"□

print  client.sysctl.list□□

print  client.sysctl.get
□'net.ipv4.icmp_echo_ignore_broadcasts'□

print  client.sysctl.set□'net.ipv4.tcp_syncookies'□ 1□
```

func□□□□□□□□□

1□□□□□□□uptime□□□5□□□□□□□□□□□□□3□□□□□□□

```
# func -t 3 "*" call --forks="5" --async command run
"/usr/bin/uptime"
```

2□□□□□□□□□□□□□□Python□□□□□□□□--jsion□--xml□□□JSON□XML□□□□□□□□

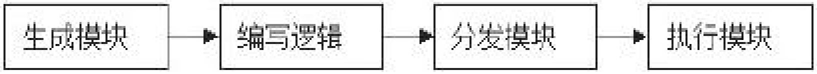
```
# func -t 3 "*" call --forks="5" --json --async command run
"/usr/bin/uptime"
```

11.3 [illegible]Func[illegible]

Func[illegible]Func[illegible]Func[illegible]Func[illegible]func-create-module[illegible]

[illegible]1[illegible]

[illegible]11-3[illegible]fun-create-module[illegible]Func[illegible]11-3[illegible]



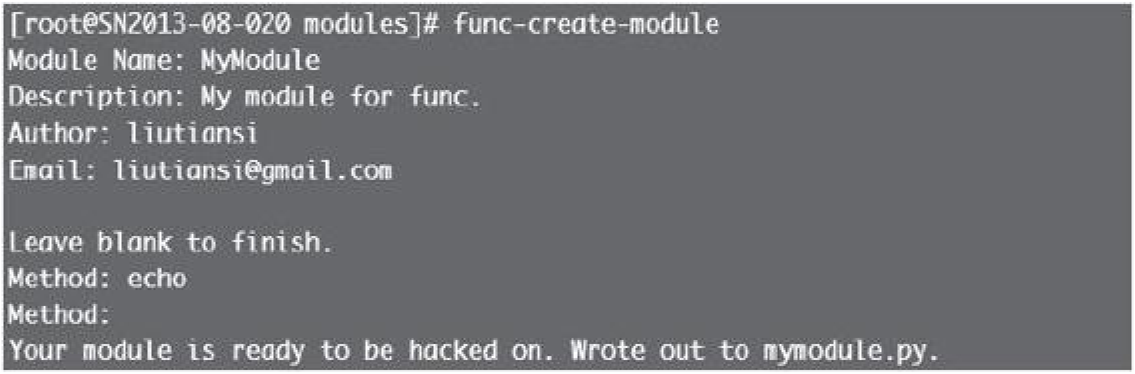
[illegible]11-3 [illegible]

[illegible]2[illegible]

[illegible]Func[illegible]minion[illegible]Python 2.6[illegible]/usr/lib/python2.6/site-packages/func/minion/modules[illegible]

```
# cd /usr/lib/python2.6/site-packages/func/minion/modules
```

□□□□□□□□func-create-module□□□□11-14□□□□□□□



```
[root@SN2013-08-020 modules]# func-create-module
Module Name: MyModule
Description: My module for func.
Author: liutiansi
Email: liutiansi@gmail.com

Leave blank to finish.
Method: echo
Method:
Your module is ready to be hacked on. Wrote out to mymodule.py.
```

□11-4　□□□□□□□□□□

□□□□□□□□□□□□□□□□□mymodule.py□

□/usr/lib/python2.6/site-packages/func/minion/modules/mymodule.py□

```
#

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# liutiansi <liutiansi@gmail.com>

#

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# general public license.

#

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# along with this program□ if not□ write to the Free
Software

# Foundation□ Inc.□ 675 Mass Ave□ Cambridge□ MA 02139□ USA.

import func_module

class Mymodule□func_module.FuncModule□□

    # Update these if need be.

    version = "0.0.1"

    api_version = "0.0.1"

    description = "My module for func."

    def echo□self□□

        """

        TODO□ Document me ...

        """

        pass
```

□3□□□□□

□□/var/log/messages□□□□□□□□□□□□□

□/usr/lib/python2.6/site-packages/func/minion/modules/mymodule.py□

```
#

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# along with this program□ if not□ write to the Free Software

# Foundation□ Inc.□ 675 Mass Ave□ Cambridge□ MA 02139□ USA.

import func_module

from func.minion import sub_process

class Mymodule□func_module.FuncModule□□

    # Update these if need be.

    version = "0.0.1"

    api_version = "0.0.1"

    description = "My module for func."

    def echo□self□vcount□□

        """

        TODO□ response system messages info

        """
        command="/usr/bin/tail -n "+str□vcount□+"
/var/log/messages"

        cmdref = sub_process.Popen□command□
stdout=sub_process.PIPE□

                                           stderr=sub_process.PIPE□
shell=True□

                                           close_fds=True□

        data = cmdref.communicate□□

        return □cmdref.returncode□ data[0]□ data[1]□
```

□4□□□□□

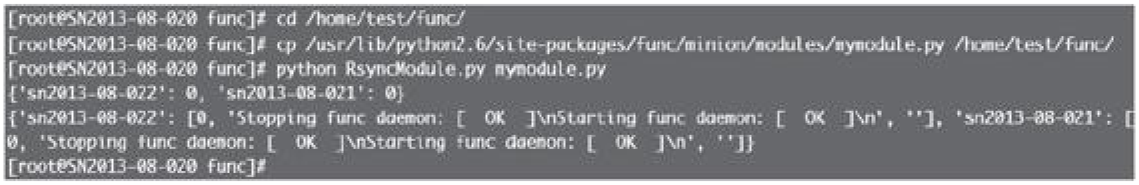
□□□□□□□□□□□□□□Func□copyfile□□□□□□□□□□□□□□□□□□□func minion□□□□□□□□□□□□□□□□Func□copyfile□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/home/test/func/RsyncModule.py□

```
#□/usr/bin/python

import sys

import func.overlord.client as fc

import xmlrpclib

module = sys.argv[1]

pythonmodulepath="/usr/lib/python2.6/site-
packages/func/minion/modules/"

client = fc.Client□"*"□
```

```
fb = file□pythonmodulepath+module□ "r"□.read□□

data = xmlrpclib.Binary□fb□

#□□□□

print client.copyfile.copyfile□pythonmodulepath+ module□
data□

#□□Func□□

print client.command.run□"/etc/init.d/funcd restart"□
```

□□□□□□□□□□□□11-5□□□



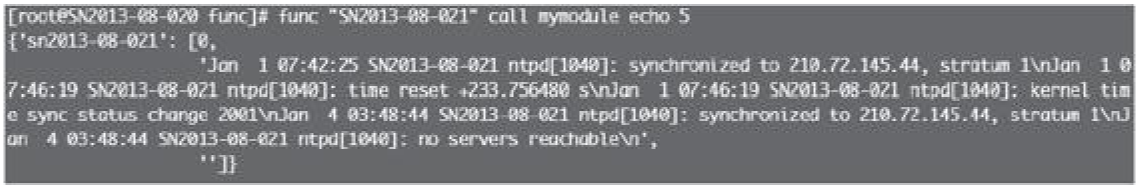
```
[root@SN2013-08-020 func]# cd /home/test/func/
[root@SN2013-08-020 func]# cp /usr/lib/python2.6/site-packages/func/minion/modules/mymodule.py /home/test/func/
[root@SN2013-08-020 func]# python RsyncModule.py mymodule.py
{'sn2013-08-022': 0, 'sn2013-08-021': 0}
{'sn2013-08-022': [0, 'Stopping func daemon: [  OK  ]\nStarting func daemon: [  OK  ]\n', ''], 'sn2013-08-021': [
0, 'Stopping func daemon: [  OK  ]\nStarting func daemon: [  OK  ]\n', '']}
[root@SN2013-08-020 func]#
```

□11-5 □□□□□

□□□□□□/usr/lib/python2.6/site-packages/func/minion/modules□□□□□□□□mymodule.py□□□□□□□□□□□□□□□□

□5□□□□□

□□□□□□□□□□□□□□11-6□



```
[root@SN2013-08-020 func]# func "SN2013-08-021" call mymodule echo 5
{'sn2013-08-021': [0,
                  'Jan  1 07:42:25 SN2013-08-021 ntpd[1040]: synchronized to 210.72.145.44, stratum 1\nJan  1 0
7:46:19 SN2013-08-021 ntpd[1040]: time reset +233.756480 s\nJan  1 07:46:19 SN2013-08-021 ntpd[1040]: kernel tim
e sync status change 2001\nJan  4 03:48:44 SN2013-08-021 ntpd[1040]: synchronized to 210.72.145.44, stratum 1\nJ
an  4 03:48:44 SN2013-08-021 ntpd[1040]: no servers reachable\n',
                  '']}
```

[illegible]11-6 [illegible]

[illegible]5[illegible]/var/log/messages[illegible]

11.4 □Python API□□□□

Func□□□Python API□□□□□□□□□□□□□□□□□□□□□□□□□□Func□□func-transmit□□□□□□□□YAML□JSON□□□□□□□□□□□□□□□□□□□□□□□Java□C□□JSON□□□□□□□□□□fun-transmit□□□□□□□□□□□□□□□□□□□□□□□

□□□□command□□□□□□□□□□□□YAML□JSON□□□□□□□□□□

□/home/test/func/run.yaml□

```
clients□ "*"

async□ False

nforks□ 1

module□ command

method□ run

parameters□ "/bin/echo Hello World"
```

□/home/test/func/run.json□

```
{

        "clients"□ "*"□

        "async"□ "False"□
        "nforks"□ 1□
        "module"□ "command"□
        "method"□ "run"□
        "parameters"□ "/bin/echo Hello World"
}
```

□□□□□□□□□□

·clients□□□□□□"*"□□□□□□□□□

·async□□□□□□□□□□□□□True□□□□□□False□□□□□

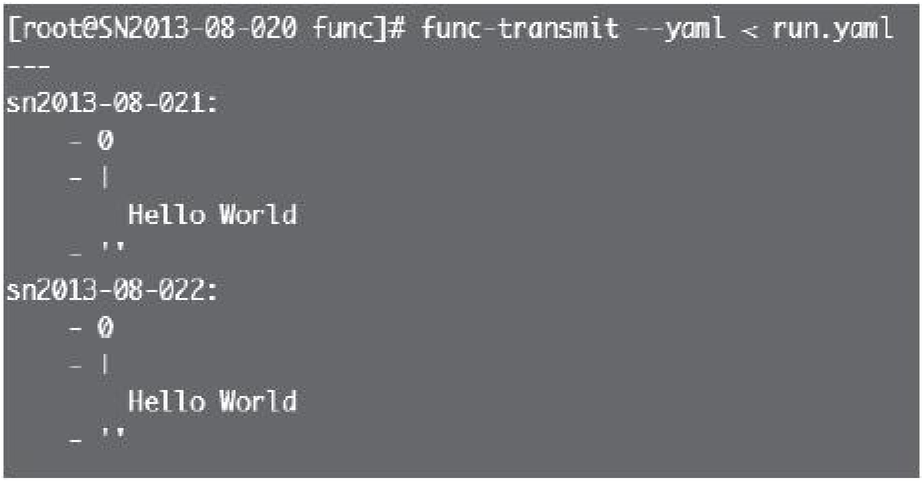
·nforks□□□□□□□□□□□□□□

·module□□□□□□□command□copyfile□process□□

·method□□□□□□□command□□□□run□□□

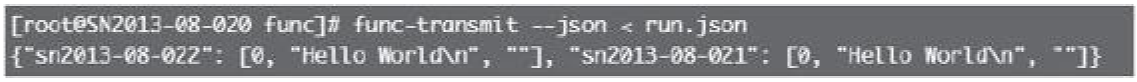
·parameters□□□□□"/usr/bin/tail-100/var/log/messages"□

□□func-transmit□□□□□□□□□□□□□□□□□□□□□□□11-7□□11-8□□□



```
[root@SN2013-08-020 func]# func-transmit --yaml < run.yaml
---
sn2013-08-021:
    - 0
    - |
        Hello World
    - ''
sn2013-08-022:
    - 0
    - |
        Hello World
    - ''
```

□11-7　□□□□□YAML□□



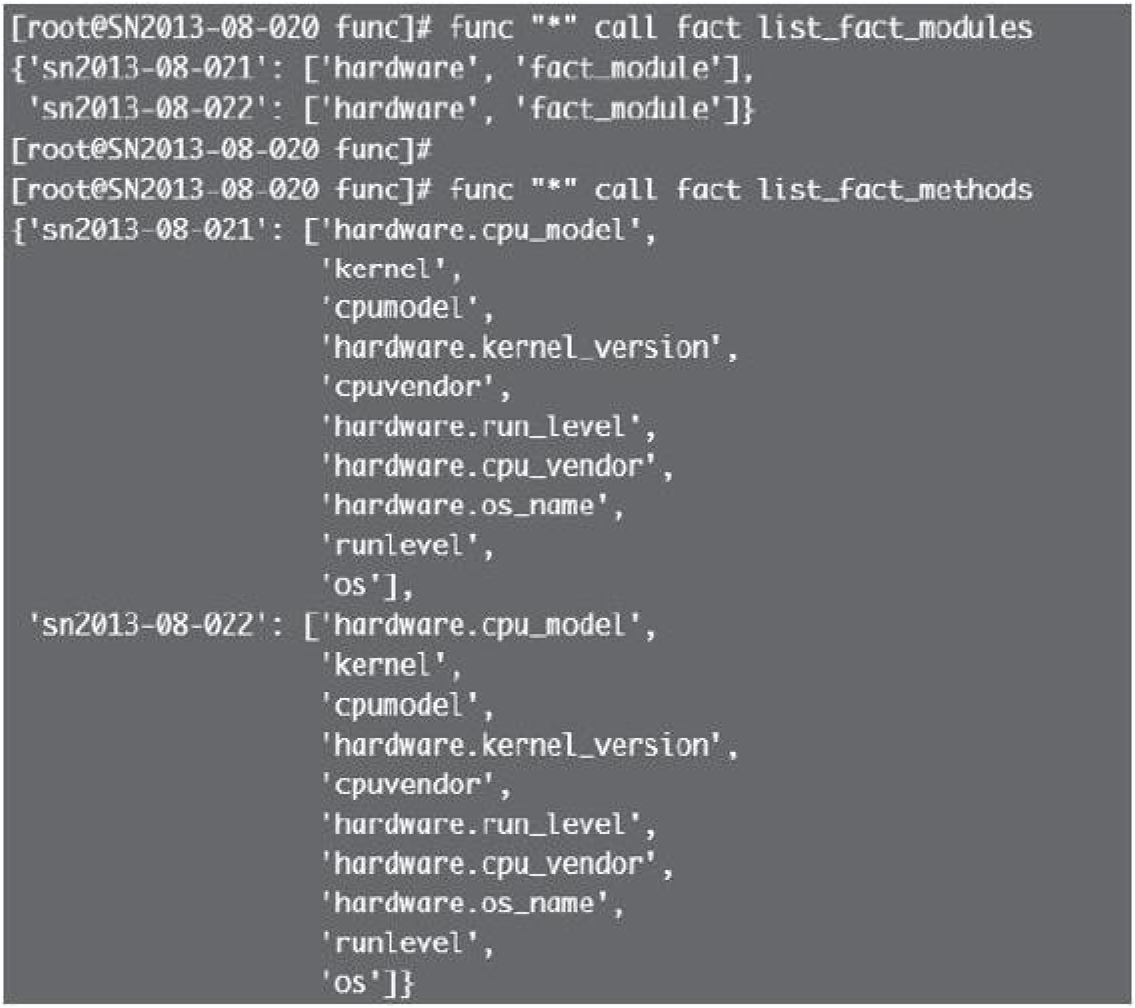
```
[root@SN2013-08-020 func]# func-transmit --json < run.json
{"sn2013-08-022": [0, "Hello World\n", ""], "sn2013-08-021": [0, "Hello World\n", ""]}
```

□11-8　□□□□□JSON□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□

11.5 Func□Facts□□

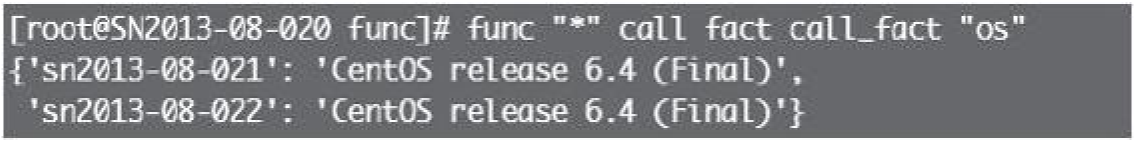
Facts□□□□□□□□□□□□□□□□□Saltstack□grains□Ansible□Facts□□Func□Facts□□□□API□□□□□□□□□□□Facts□□□□□□□□□□□□module□□□□□□□method□□□□□list_fact_modules□list_fact_methods□□□□□□□□□□□□□□□□□□□□□□11-9□□□



```
[root@SN2013-08-020 func]# func "*" call fact list_fact_modules
{'sn2013-08-021': ['hardware', 'fact_module'],
 'sn2013-08-022': ['hardware', 'fact_module']}
[root@SN2013-08-020 func]#
[root@SN2013-08-020 func]# func "*" call fact list_fact_methods
{'sn2013-08-021': ['hardware.cpu_model',
                   'kernel',
                   'cpumodel',
                   'hardware.kernel_version',
                   'cpuvendor',
                   'hardware.run_level',
                   'hardware.cpu_vendor',
                   'hardware.os_name',
                   'runlevel',
                   'os'],
 'sn2013-08-022': ['hardware.cpu_model',
                   'kernel',
                   'cpumodel',
                   'hardware.kernel_version',
                   'cpuvendor',
                   'hardware.run_level',
                   'hardware.cpu_vendor',
                   'hardware.os_name',
                   'runlevel',
                   'os']}
```

□11-9 □□□□□□□□□□□

□□□Facts□□□□□□□□□□□func"*"call fact list_fact_methods□□□□□□□□□□□□□□□□□Facts□call_fact□□□□□□□□□□□□□□□□□□□□11-10□



```
[root@SN2013-08-020 func]# func "*" call fact call_fact "os"
{'sn2013-08-021': 'CentOS release 6.4 (Final)',
 'sn2013-08-022': 'CentOS release 6.4 (Final)'}
```

□11-10 □□□□□□□□□□

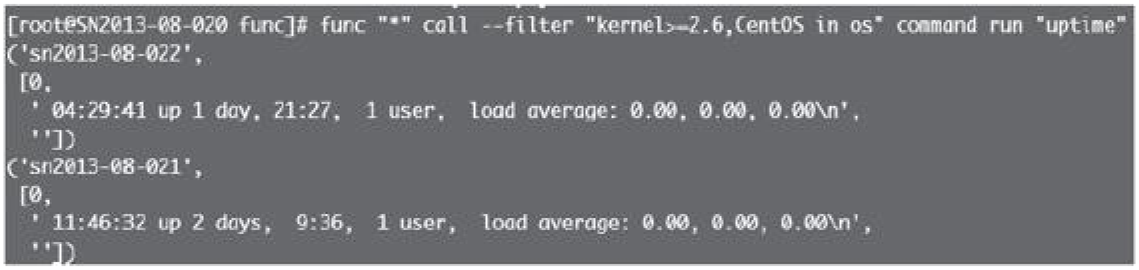
Fact□□and□or□□□□□□□□□□□□□□□□□□□□

□1□and□□□--filter

□□□

```
--filter "keyword[operator]value□keyword2[operator]value2"

--filter "value in keyword□value ini keyword"
```

□□□□□□□□□□kernel□□□□□□□□2.6□□□□□□□□□□□CentOS□□□□□□□uptime□□□□□11-11□□□



```
[root@SN2013-08-020 func]# func "*" call --filter "kernel>=2.6,CentOS in os" command run "uptime"
('sn2013-08-022',
 [0,
  ' 04:29:41 up 1 day, 21:27,  1 user,  load average: 0.00, 0.00, 0.00\n',
  ''])
('sn2013-08-021',
 [0,
  ' 11:46:32 up 2 days,  9:36,  1 user,  load average: 0.00, 0.00, 0.00\n',
  ''])
```

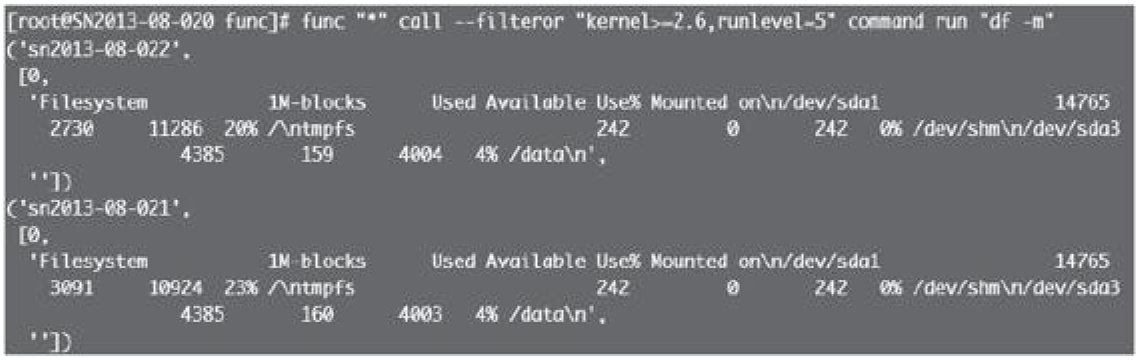
□11-11　□□fact□□□and□□□□□

□2□or□□□--filteror

□□□

```
--filteror "keyword[operator]value□
keyword2[operator]value2"

--filteror "value in keyword□value ini keyword"
```

□□□□□□□□□□kernel□□□□□□□□2.6□□□□□□□□□5□□□□□□□df-m□□□□□11-12□□□



```
[root@SN2013-08-020 func]# func "*" call --filteror "kernel>=2.6,runlevel=5" command run "df -m"
('sn2013-08-022',
 [0,
  'Filesystem           1M-blocks      Used Available Use% Mounted on\n/dev/sda1              14765
    2730     11286  20% /\ntmpfs                         242         0       242   0% /dev/shm\n/dev/sda3
              4385       159      4004   4% /data\n',
  ''])
('sn2013-08-021',
 [0,
  'Filesystem           1M-blocks      Used Available Use% Mounted on\n/dev/sda1              14765
    3091     10924  23% /\ntmpfs                         242         0       242   0% /dev/shm\n/dev/sda3
              4385       160      4003   4% /data\n',
  ''])
```

□11-12　□□fact□□□or□□□□□

□□□□　11.1□~11.5□□□Func□□□□□□□□□https://fedorahosted.org/func/□

[illegible]12[illegible] Python[illegible]

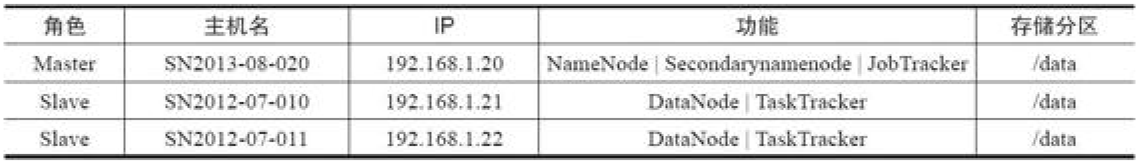
[illegible]big data[illegible]TB[illegible]PB[illegible]Hadoop[illegible]MapReduce[illegible]Hadoop[illegible]Java[illegible]MapReduce[illegible]Streaming[illegible]MapReduce[illegible]Python[illegible]Python[illegible]Framework[illegible]

[illegible] [illegible]Hadoop[illegible]

12.1 □□□□

□□□□□□□□□□□□□□□□□□□□□Hadoop□□□□□□□□□□□□□□□CentOS release 6.4□□□Python 2.6.6□hadoop-1.2.1□jdk1.6.0_45□mrjob-0.4.2□□□□□□□□□□□12-1□□□

□12-1 □□□□□



角色	主机名	IP	功能	存储分区
Master	SN2013-08-020	192.168.1.20	NameNode | Secondarynamenode | JobTracker	/data
Slave	SN2012-07-010	192.168.1.21	DataNode | TaskTracker	/data
Slave	SN2012-07-011	192.168.1.22	DataNode | TaskTracker	/data

12.2 Hadoop[illegible]

[illegible]Hadoop[illegible]Master[illegible]Salve[illegible]9.2.5[illegible]Linux[illegible]SSH[illegible]

[illegible]1[illegible]

SSH[illegible]Master[illegible]root[illegible]JDK[illegible]

```
# mkdir –p /usr/java/ && cd /usr/java

# wget http[illegible]//uni-
smr.ac.ru/archive/dev/java/SDKs/sun/j2se/6/jdk-6u45-linux-
x64.bin

# chmod +x jdk-6u45-linux-x64.bin

# ./jdk-6u45-linux-x64.bin

# vi /etc/profile [illegible]Java[illegible]

export JAVA_HOME=/usr/java/jdk1.6.0_45

export PATH=$PATH[illegible]$JAVA_HOME/bin

export CLASSPATH=.[illegible]$JAVA_HOME/jre/lib[illegible]$JAVA_HOME/lib[illegible]
$JAVA_HOME/lib/tools.jar

# cd /etc  [illegible]

# . profile
```

[illegible]Hadoop[illegible]1.2.1[illegible]/usr/local[illegible]

```
# cd /usr/local

# wget http□//mirrors.cnnic.cn/apache/hadoop/common/hadoop-1.2.1/hadoop-1.2.1.tar.gz

# tar –zxvf hadoop-1.2.1.tar.gz

# cd /usr/local/hadoop-1.2.1/conf
```

□□□□□/usr/local/hadoop-1.2.1/conf□□□□□Hadoop□□□□□□hadoop-env.sh□core-site.xml□hdfs-site.xml□mapred-site.xml□□□□□□□□

·hadoop-env.sh□Hadoop□□□□□□□□□□□JAVA_HOME□

```
export JAVA_HOME=/usr/java/jdk1.6.0_45
```

·core-site.xml□Hadoop core□□□□□□□□Common□□□□□□□□□□□□□hadoop.tmp.dir□□□□/tmp/hadoop-${user.name}□□□□Linux□□□/tmp□□□□□□□□Hadoop□□□□□□□“File/tmp//input/conf/slaves could only be replicated to 0 nodes□instead of 1”□□□□□□□□□hadoop.tmp.dir□□/data/tmp/hadoop-${user.name}□□□Hadoop□□□□□□□□□□□□□□□

```
<configuration>

<property>

  <name>hadoop.tmp.dir</name>

  <value>/data/tmp/hadoop-${user.name}</value>

</property>

<property>

<name>fs.default.name</name>

<value>hdfs□//192.168.1.20□9000</value>  //master□□IP□9000□
□

</property>

</configuration>
```

·hdfs-site.xml□Hadoop□HDFS□□□□□□□□□Namenode□Secondarynamenode□Datanode□□□□□□□

```
<configuration>

<property>

<name>dfs.name.dir</name>

<value>/data/hdfs/name</value>    //Namenode□□□□□□□□□□□□□□□

</property>

<property>

<name>dfs.data.dir</name>
```

```
<value>/data/hdfs/data</value>    //Datanode□□□□□□

</property>

<property>

<name>dfs.datanode.max.xcievers</name>

<value>4096</value>    //Datanode□□□□□□□□□□□□□□□□□□□□□256

</property>

<property>

<name>dfs.replication</name>

<value>2</value>    //□□□□□□□□□□□□3

</property>

</configuration>
```

·mapred-site.xml□□□map-reduce□□□□□□□□jobtracker□tasktracker□□□□□□

```
<configuration>

<property>

<name>mapred.job.tracker</name>

<value>192.168.1.20□9001</value>

</property>

</configuration>
```

·masters[illegible]Secondarynamenode[illegible]192.168.1.20[illegible]Secondarynamenode[illegible]HDFS[illegible]metadata[illegible]NameNode[illegible]

```
192.168.1.20
```

·slaves[illegible]Slave[illegible]IP[illegible]Slave[illegible]

```
192.168.1.21

192.168.1.22
```

[illegible]Master[illegible]jdk[illegible]Hadoop[illegible]Slave[illegible]Master[illegible]

```
# ssh root@192.168.1.21 '[ -d /usr/java ] || mkdir -p /usr/java ]'

# ssh root@192.168.1.22 '[ -d /usr/java ] || mkdir -p /usr/java ]'

# scp -r /usr/java/jdk1.6.0_45 root@192.168.1.21[illegible]/usr/java

# scp -r /usr/java/jdk1.6.0_45 root@192.168.1.22[illegible]/usr/java

# scp -r /usr/local/hadoop-1.2.1 root@192.168.1.21[illegible]/usr/local
# scp -r /usr/local/hadoop-1.2.1
root@192.168.1.22[illegible]/usr/local
```

Hadoop[illegible]hosts[illegible]DNS[illegible]Hadooop[illegible]/etc/hosts[illegible]

```
192.168.1.20    SN2013-08-020

192.168.1.21    SN2013-08-021

192.168.1.22    SN2013-08-022
```

[illegible]datanode[illegible]hosts[illegible]Windows 7[illegible]hosts[illegible]C:\Windows\System32\drivers\etc[illegible]datanode[illegible]

```
192.168.1.21    SN2013-08-021

192.168.1.22    SN2013-08-022
```

[illegible]iptables[illegible]Master[illegible]Slave[illegible]

```
Master[illegible]

iptables -I INPUT -s 192.168.1.0/24 -p tcp --dport 50030 -j
ACCEPT
```

```
iptables -I INPUT -s 192.168.1.0/24 -p tcp --dport 50070 -j
ACCEPT

iptables -I INPUT -s 192.168.1.0/24 -p tcp --dport 9000 -j
ACCEPT

iptables -I INPUT -s 192.168.1.0/24 -p tcp --dport 9001 -j
ACCEPT
```

Slaves[illegible]

```
iptables -I INPUT -s 192.168.1.0/24 -p tcp --dport 50075 -j
ACCEPT

iptables -I INPUT -s 192.168.1.0/24 -p tcp --dport 50060 -j
ACCEPT

iptables -I INPUT -s 192.168.1.20 -p tcp --dport 50010 -j
ACCEPT
```

[illegible]Master[illegible]namenode[illegible]

```
# cd /usr/local/hadoop-1.2.1

# bin/hadoop namenode -format
```

[illegible]Master[illegible]

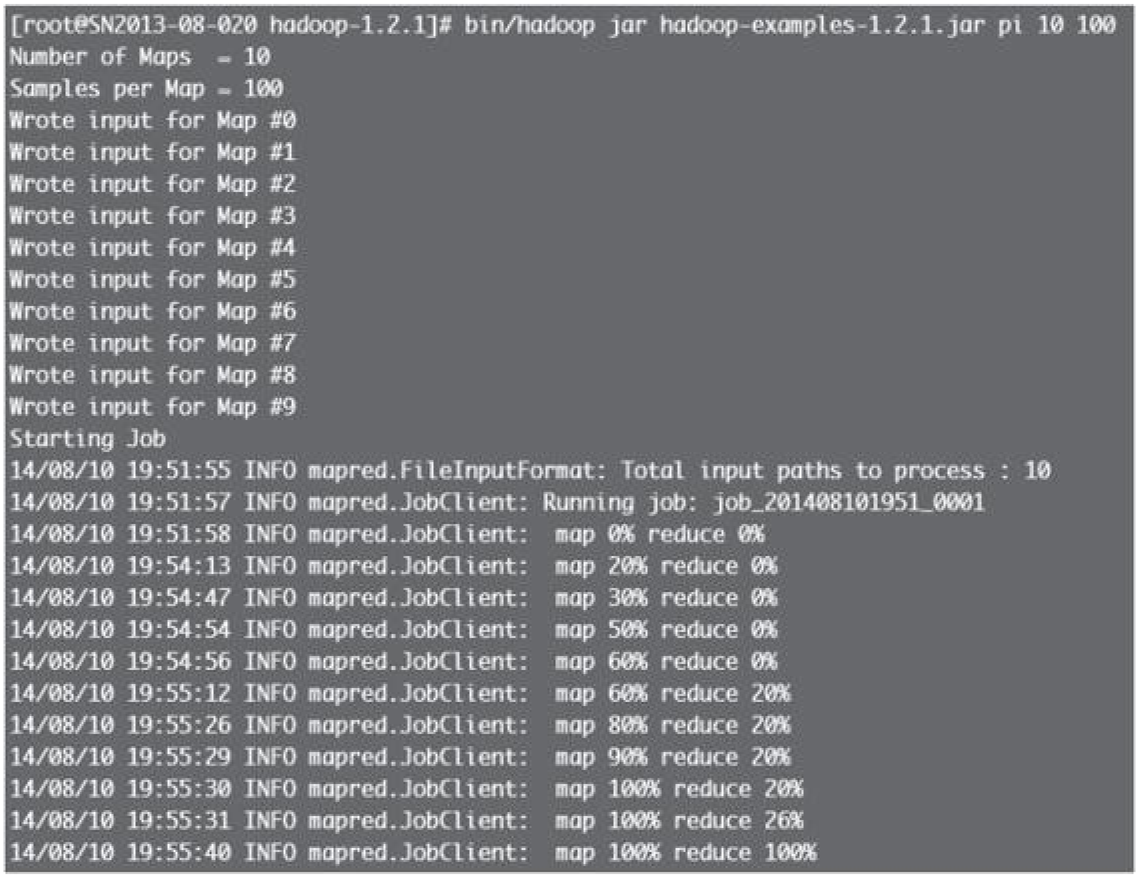
```
# bin/start-all.sh
```

[illegible]2[illegible]

Hadoop[illegible]MapReduce[illegible]

```
# bin/hadoop jar hadoop-examples-1.2.1.jar pi 10 100
```

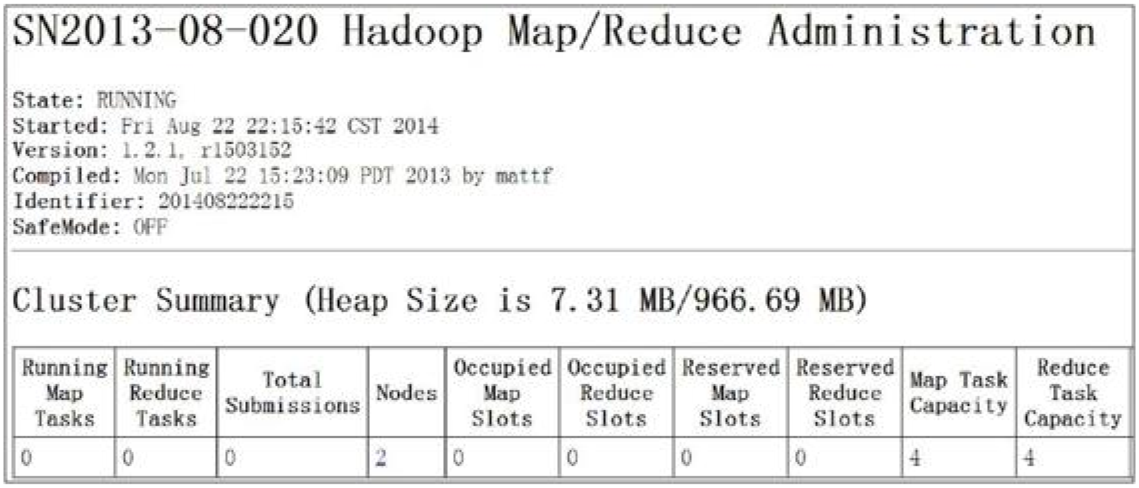
□□□□□12-1□□□□□□□□□□□



```
[root@SN2013-08-020 hadoop-1.2.1]# bin/hadoop jar hadoop-examples-1.2.1.jar pi 10 100
Number of Maps  = 10
Samples per Map = 100
Wrote input for Map #0
Wrote input for Map #1
Wrote input for Map #2
Wrote input for Map #3
Wrote input for Map #4
Wrote input for Map #5
Wrote input for Map #6
Wrote input for Map #7
Wrote input for Map #8
Wrote input for Map #9
Starting Job
14/08/10 19:51:55 INFO mapred.FileInputFormat: Total input paths to process : 10
14/08/10 19:51:57 INFO mapred.JobClient: Running job: job_201408101951_0001
14/08/10 19:51:58 INFO mapred.JobClient:  map 0% reduce 0%
14/08/10 19:54:13 INFO mapred.JobClient:  map 20% reduce 0%
14/08/10 19:54:47 INFO mapred.JobClient:  map 30% reduce 0%
14/08/10 19:54:54 INFO mapred.JobClient:  map 50% reduce 0%
14/08/10 19:54:56 INFO mapred.JobClient:  map 60% reduce 0%
14/08/10 19:55:12 INFO mapred.JobClient:  map 60% reduce 20%
14/08/10 19:55:26 INFO mapred.JobClient:  map 80% reduce 20%
14/08/10 19:55:29 INFO mapred.JobClient:  map 90% reduce 20%
14/08/10 19:55:30 INFO mapred.JobClient:  map 100% reduce 20%
14/08/10 19:55:31 INFO mapred.JobClient:  map 100% reduce 26%
14/08/10 19:55:40 INFO mapred.JobClient:  map 100% reduce 100%
```

□12-1　□□pi□□□□□□□□□

□□Hadoop□□□□□□□Map/Reduce□□□□
http://192.168.1.20□50030/□□□12-2□□□



SN2013-08-020 Hadoop Map/Reduce Administration

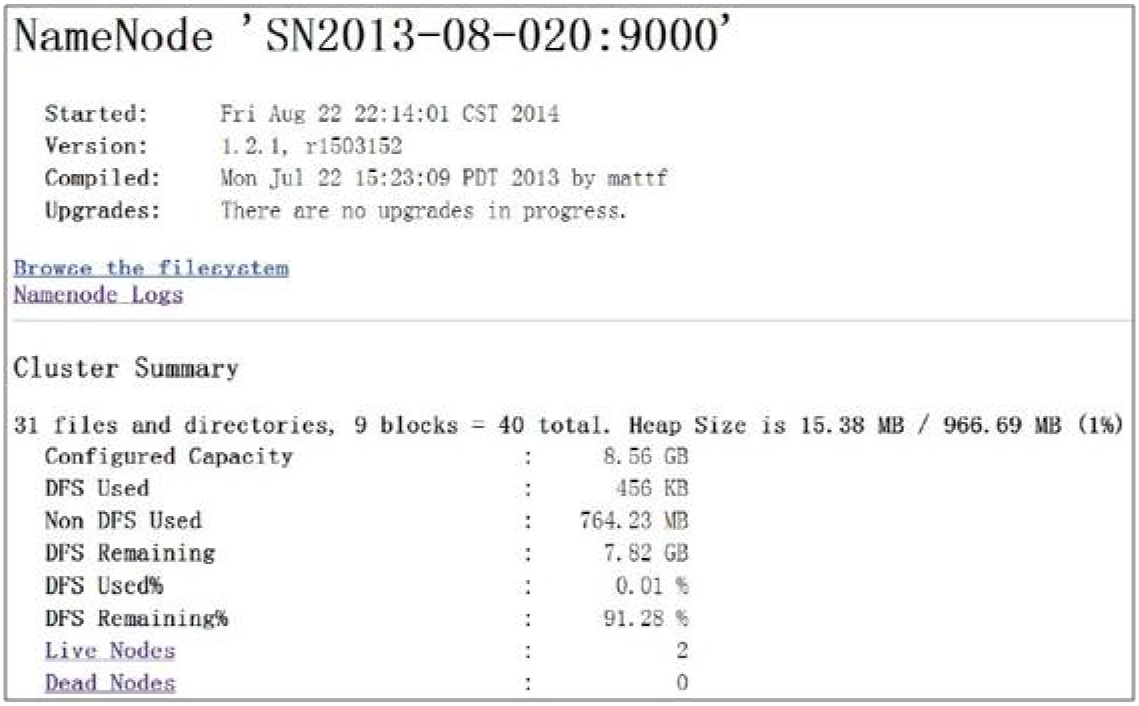
State: RUNNING
Started: Fri Aug 22 22:15:42 CST 2014
Version: 1.2.1, r1503152
Compiled: Mon Jul 22 15:23:09 PDT 2013 by mattf
Identifier: 201408222215
SafeMode: OFF

Cluster Summary (Heap Size is 7.31 MB/966.69 MB)

Running Map Tasks	Running Reduce Tasks	Total Submissions	Nodes	Occupied Map Slots	Occupied Reduce Slots	Reserved Map Slots	Reserved Reduce Slots	Map Task Capacity	Reduce Task Capacity
0	0	0	2	0	0	0	0	4	4

[illegible]12-2　Map/Reduce[illegible]

HDFS[illegible]http://192.168.1.20[illegible]50070/[illegible]12-3[illegible]



NameNode 'SN2013-08-020:9000'

Started: Fri Aug 22 22:14:01 CST 2014
Version: 1.2.1, r1503152
Compiled: Mon Jul 22 15:23:09 PDT 2013 by mattf
Upgrades: There are no upgrades in progress.

Browse the filesystem
Namenode Logs

Cluster Summary

31 files and directories, 9 blocks = 40 total. Heap Size is 15.38 MB / 966.69 MB (1%)

Configured Capacity : 8.56 GB
DFS Used : 456 KB
Non DFS Used : 764.23 MB
DFS Remaining : 7.82 GB
DFS Used% : 0.01 %
DFS Remaining% : 91.28 %
Live Nodes : 2
Dead Nodes : 0

[illegible]12-3　HDFS[illegible]

12.3 □□Python□□MapReduce

Map□Reduce□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□map□□□□□□□reduce□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□map□□□□□□□□□□□□□□□□□□reduce□□□□□□□□□Hadoop□□□□□□□□Java□□□MapReduce□□□□□□□□□□□□□□API——Hadoop Streaming□□□□□□□□□□□□□□□□□map□reduce□□□□□□□□□□Python□□□sys.stdin□□□□□sys.stdout□□□□□□□□□□□□□□□Python□□□□

□□□□□□□□□□□□□/home/test/hadoop/input.txt□□□□□□□□□□□□□□□□□□□□Python□□□□□□□□mapreduce□□□□□□□□□□

□/home/test/hadoop/input.txt□

```
foo foo quux labs foo bar quux abc bar see you by test
welcome test

abc labs foo me python hadoop ab ac bc bec python
```

12.3.1 □□□Python□□MapReduce□□

□1□□□Map□□

□□□□mapper.py□□□□□□□□□□□stdin□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□stdout□□□□□□Map□□□□□□□□□□□□□□□□□□□□□□□□□□“word 1”□□□□□Reduce□□□□□□□□□□mapper.py□□□□□□□□□□chmod+x/home/test/hadoop/mapper.py□

□/home/test/hadoop/mapper.py□

```
#□/usr/bin/env python

import sys

#□□□□□□□stdin□

for line in sys.stdin□

    #□□□□□□□□□□□

    line = line.strip□□

    #□□□□□□□□□□□words□□□

    words = line.split□□

    for word in words□

        #□□□□□□□□□□“□□□1”□□□□Reduce□□□□

        print '%s\t%s' % □word□ 1□
```

□2□□□Reduce□□

□□□□reducer.py□□□□□□□□□□□stdin□□□mapper.py□□□□□□□□□□□□□□□□□□□□□□□□□□

□stdout□□□□reducer.py□□□□□□□□□□□□
chmod+x/home/test/hadoop/reducer.py□

□/home/test/hadoop/reducer.py□

```
#□/usr/bin/env python
from operator import itemgetter
import sys
current_word = None
current_count = 0
word = None
# □□□□□□□□mapper.py□□□□
for line in sys.stdin□
    #□□□□□□□□□□□
    line = line.strip□□
    # □□mapper.py□□□□□□□□□□□tab□□□□□□
    word□ count = line.split□'\t'□ 1□
    # □□count□□□□□□□□
    try□
        count = int□count□
    except ValueError□
        # count□□□□□□□□□□
        continue
    # [illegible]mapper.py[illegible]sort[illegible]word[illegible]
    if current_word == word[illegible]
        current_count += count
    else[illegible]
        if current_word[illegible]
            # [illegible]word[illegible]
            print '%s\t%s' % [illegible]current_word[illegible] current_count[illegible]
        current_count = count
        current_word = word
# [illegible]word[illegible]
if current_word == word[illegible]
    print '%s\t%s' % [illegible]current_word[illegible] current_count[illegible]
```

[illegible]3[illegible]

[illegible]Hadoop[illegible] mapper.py[illegible]reducer.py[illegible] 12-4[illegible]

[illegible]reducer.py[illegible]mapper.py[illegible]sort[illegible]Hadoop[illegible]12-5[illegible]

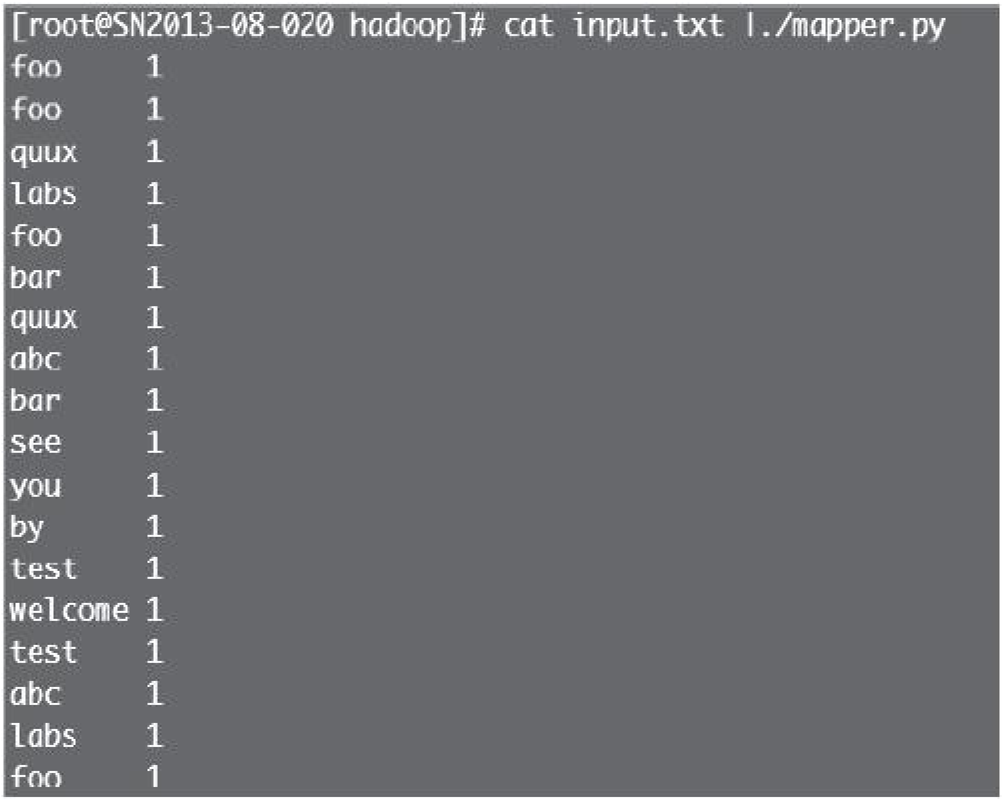
[illegible]4[illegible]Hadoop[illegible]

[illegible]HDFS[illegible] [illegible]/user/root/word[illegible]

```
# /usr/local/hadoop-1.2.1/bin/hadoop dfs -mkdir
/user/root/word
```

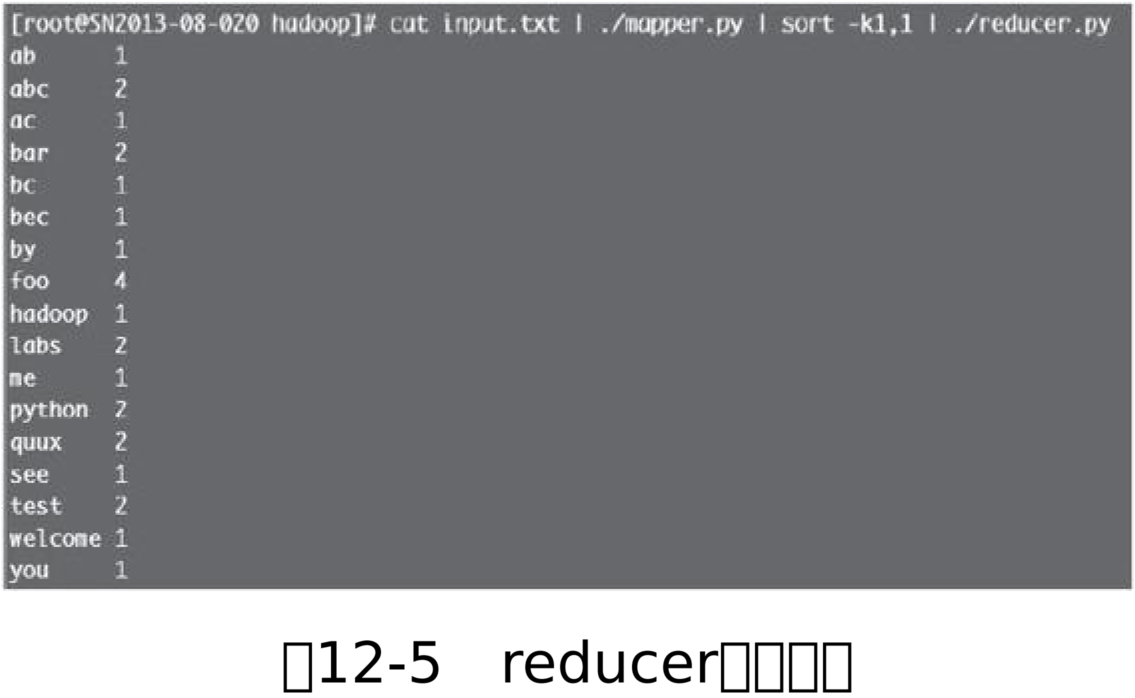
[illegible]HDFS[illegible]/home/test/hadoop/input.txt[illegible]Hadoop[illegible]

```
# /usr/local/hadoop-1.2.1/bin/hadoop fs –put
/home/test/hadoop/input.txt /user/root/word/

# /usr/local/hadoop-1.2.1/bin/hadoop dfs -ls
/user/root/word/

Found 1 items

-rw-r--r--   2 root supergroup   118 2014-02-10 09[illegible]49
/user/root/word/input.txt
```



```
[root@SN2013-08-020 hadoop]# cat input.txt |./mapper.py
foo     1
foo     1
quux    1
labs    1
foo     1
bar     1
quux    1
abc     1
bar     1
see     1
you     1
by      1
test    1
welcome 1
test    1
abc     1
labs    1
foo     1
```

□12-4　mapper□□□□□□□□□□



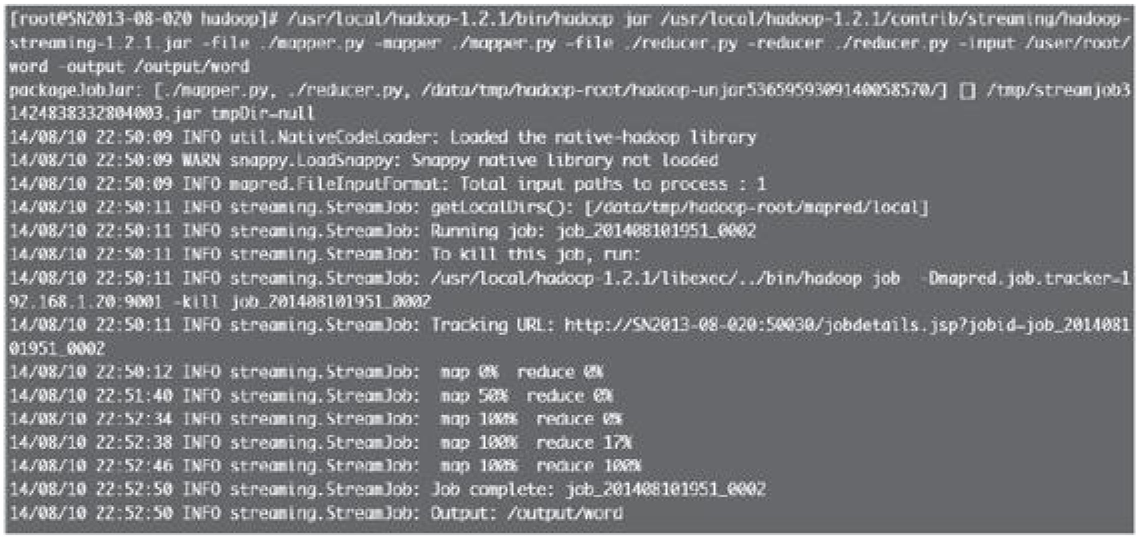
```
[root@SN2013-08-020 hadoop]# cat input.txt | ./mapper.py | sort -k1,1 | ./reducer.py
ab      1
abc     2
ac      1
bar     2
bc      1
bec     1
by      1
foo     4
hadoop  1
labs    2
me      1
python  2
quux    2
see     1
test    2
welcome 1
you     1
```

□12-5　reducer□□□□

□□□□□□□□□□MapReduce□□□□□□□□□□□□/output/word□□□□□□□□

```
# /usr/local/hadoop-1.2.1/bin/hadoop jar /usr/local/hadoop-
1.2.1/contrib/streaming/hadoop-streaming-1.2.1.jar -file
./mapper.py -mapper ./mapper.py -file ./reducer.py -reducer
./reducer.py -input /user/root/word -output /output/word
```

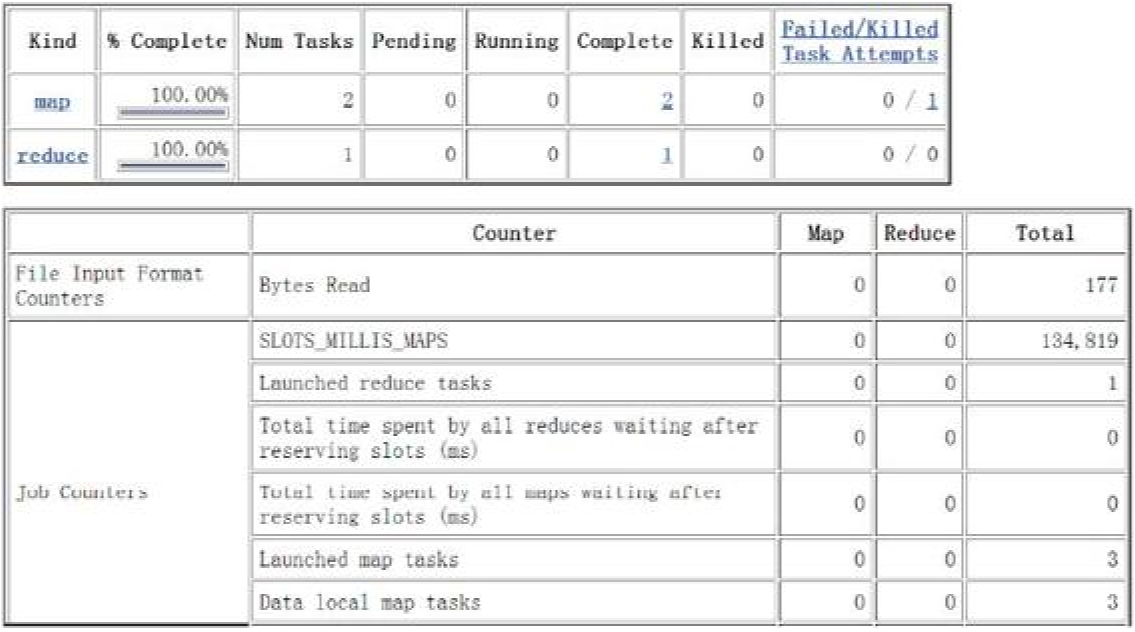
□12-6□□□□□□□□□□□□□map□reduce□□□□□□□□□



```
[root@SN2013-08-020 hadoop]# /usr/local/hadoop-1.2.1/bin/hadoop jar /usr/local/hadoop-1.2.1/contrib/streaming/hadoop-
streaming-1.2.1.jar -file ./mapper.py -mapper ./mapper.py -file ./reducer.py -reducer ./reducer.py -input /user/root/
word -output /output/word
packageJobJar: [./mapper.py, ./reducer.py, /data/tmp/hadoop-root/hadoop-unjar5365959309140058570/] [] /tmp/streamjob3
1424838332804003.jar tmpDir=null
14/08/10 22:50:09 INFO util.NativeCodeLoader: Loaded the native-hadoop library
14/08/10 22:50:09 WARN snappy.LoadSnappy: Snappy native library not loaded
14/08/10 22:50:09 INFO mapred.FileInputFormat: Total input paths to process : 1
14/08/10 22:50:11 INFO streaming.StreamJob: getLocalDirs(): [/data/tmp/hadoop-root/mapred/local]
14/08/10 22:50:11 INFO streaming.StreamJob: Running job: job_201408101951_0002
14/08/10 22:50:11 INFO streaming.StreamJob: To kill this job, run:
14/08/10 22:50:11 INFO streaming.StreamJob: /usr/local/hadoop-1.2.1/libexec/../bin/hadoop job  -Dmapred.job.tracker=1
92.168.1.20:9001 -kill job_201408101951_0002
14/08/10 22:50:11 INFO streaming.StreamJob: Tracking URL: http://SN2013-08-020:50030/jobdetails.jsp?jobid=job_2014081
01951_0002
14/08/10 22:50:12 INFO streaming.StreamJob:  map 0%  reduce 0%
14/08/10 22:51:40 INFO streaming.StreamJob:  map 50%  reduce 0%
14/08/10 22:52:34 INFO streaming.StreamJob:  map 100%  reduce 0%
14/08/10 22:52:38 INFO streaming.StreamJob:  map 100%  reduce 17%
14/08/10 22:52:46 INFO streaming.StreamJob:  map 100%  reduce 100%
14/08/10 22:52:50 INFO streaming.StreamJob: Job complete: job_201408101951_0002
14/08/10 22:52:50 INFO streaming.StreamJob: Output: /output/word
```

□12-6　□□MapReduce□□□□

□□http://192.168.1.20□50030/jobtracker.jsp□□□□□□Jobid□□□mapreduce job□□□□□12-7□□□

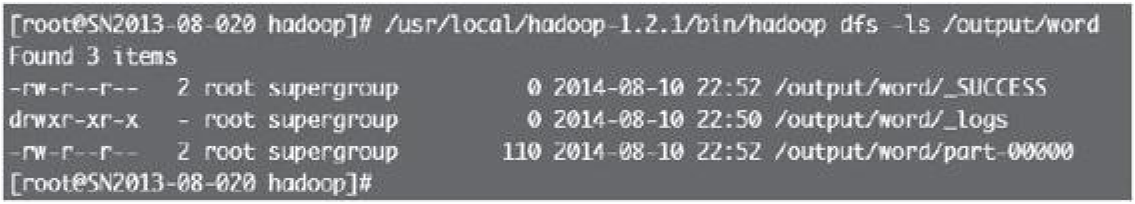


Kind	% Complete	Num Tasks	Pending	Running	Complete	Killed	Failed/Killed Task Attempts
map	100.00%	2	0	0	2	0	0 / 1
reduce	100.00%	1	0	0	1	0	0 / 0

	Counter	Map	Reduce	Total
File Input Format Counters	Bytes Read	0	0	177
Job Counters	SLOTS_MILLIS_MAPS	0	0	134,819
	Launched reduce tasks	0	0	1
	Total time spent by all reduces waiting after reserving slots (ms)	0	0	0
	Total time spent by all maps waiting after reserving slots (ms)	0	0	0
	Launched map tasks	0	0	3
	Data local map tasks	0	0	3

□12-7　Web□□mapreduce job□□□□□□□□

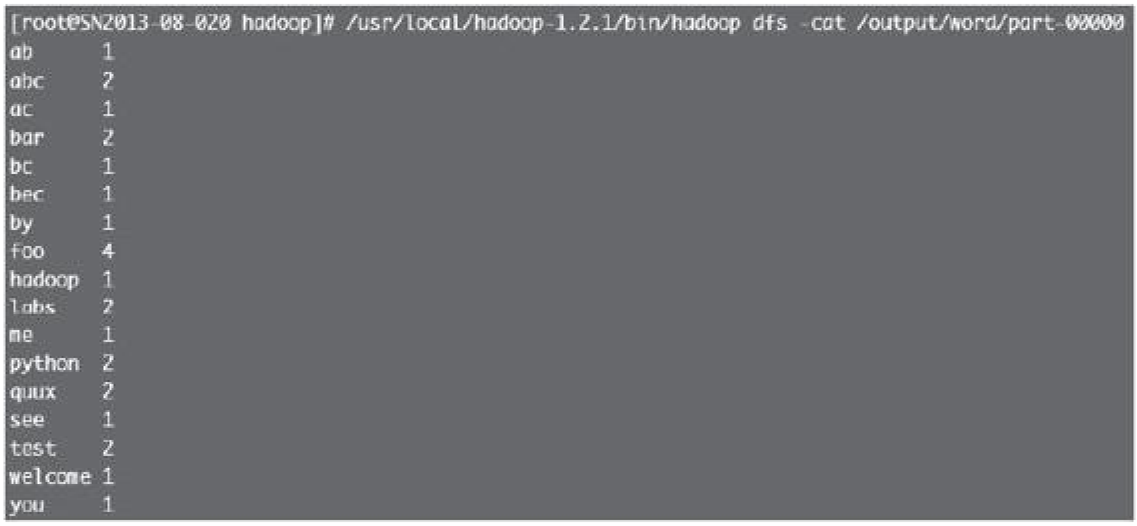
□□□□□□□□□□□□□□□□/output/word/part-00000□□□□□□□□□□12-8□□□



```
[root@SN2013-08-020 hadoop]# /usr/local/hadoop-1.2.1/bin/hadoop dfs -ls /output/word
Found 3 items
-rw-r--r--   2 root supergroup          0 2014-08-10 22:52 /output/word/_SUCCESS
drwxr-xr-x   - root supergroup          0 2014-08-10 22:50 /output/word/_logs
-rw-r--r--   2 root supergroup        110 2014-08-10 22:52 /output/word/part-00000
[root@SN2013-08-020 hadoop]#
```

□12-8　□□□□□□□□

□□□□□□□□□□12-9□□□□□□□□□□□□□□□□□□□□□□



```
[root@SN2013-08-020 hadoop]# /usr/local/hadoop-1.2.1/bin/hadoop dfs -cat /output/word/part-00000
ab      1
abc     2
ac      1
bar     2
bc      1
bec     1
by      1
foo     4
hadoop  1
labs    2
me      1
python  2
quux    2
see     1
test    2
welcome 1
you     1
```

□12-9 □□□□□□part-00000□□

□□ HDFS□□□□□□□□

1□□□□□□□□□bin/hadoop dfs-mkdir/data/root/test□

2□□□□□□□□□□□bin/hadoop dfs-ls/data/root□

3□□□□□□□□□□□□bin/hadoop fs-rmr/data/root/test□

4□□□□□□□□□bin/hadoop fs-put/home/test/hadoop/*.txt/data/root/test□

5□□□□□□□□□□□bin/hadoop dfs-cat/output/word/part-00000□

12.3.2 □Mrjob□□□□MapReduce□□

Mrjob □http://pythonhosted.org/mrjob/index.html □□□□□□MapReduce□□□□□Python□□□□□□□□Hadoop Streaming□□□□□□□□□□□□□□□□Hadoop□□□□□□□□□□□□□□□□□□□□□MapReduce□□□Mrjob□□□□□□□

1□□□□□□map□reduce□□□□□□Python□□□□□□□□

2□□□□□□□MapReduce□□□□□□

3□□□□□□□□□□□□□□□□□□□□□□Hadoop□□□□□□□

4□□□□□□□□□□□□□□Elastic MapReduce□EMR□□

5□□□□□□□□□□□□□□□

□□Mrjob□□□□□Python 2.5□□□□□□□□□□□□□https://github.com/yelp/mrjob□

```
# pip install mrjob     #PyPI□□□□

# python setup.py install     #□□□□□□
```

[illegible]

[illegible]/home/test/hadoop/input.txt[illegible]Mrjob[illegible]mapper[illegible]reducer[illegible]MR[illegible]

[illegible]/home/test/hadoop/word_count.py[illegible]

```
from mrjob.job import MRJob

class MRWordCounter[illegible]MRJob[illegible]

    def mapper[illegible]self[illegible] key[illegible] line[illegible]

        for word in line.split[illegible]

            yield word[illegible] 1

    def reducer[illegible]self[illegible] word[illegible] occurrences[illegible]

        yield word[illegible] sum[illegible]occurrences[illegible]

if __name__ == '__main__'[illegible]

    MRWordCounter.run[illegible]
```

[illegible]Python[illegible]1/3[illegible]mapper[illegible]reducer[illegible]mapper[illegible]key[illegible]value[illegible]value[illegible]1[illegible]reducer[illegible]mapper[illegible]key-value[illegible]key[illegible]value[illegible]sum[illegible]Mrjob[illegible]Python[illegible]yield[illegible]Generators[illegible]next[illegible]key-value[illegible]Mrjob[illegible]-r inline[illegible]-r local[illegible]

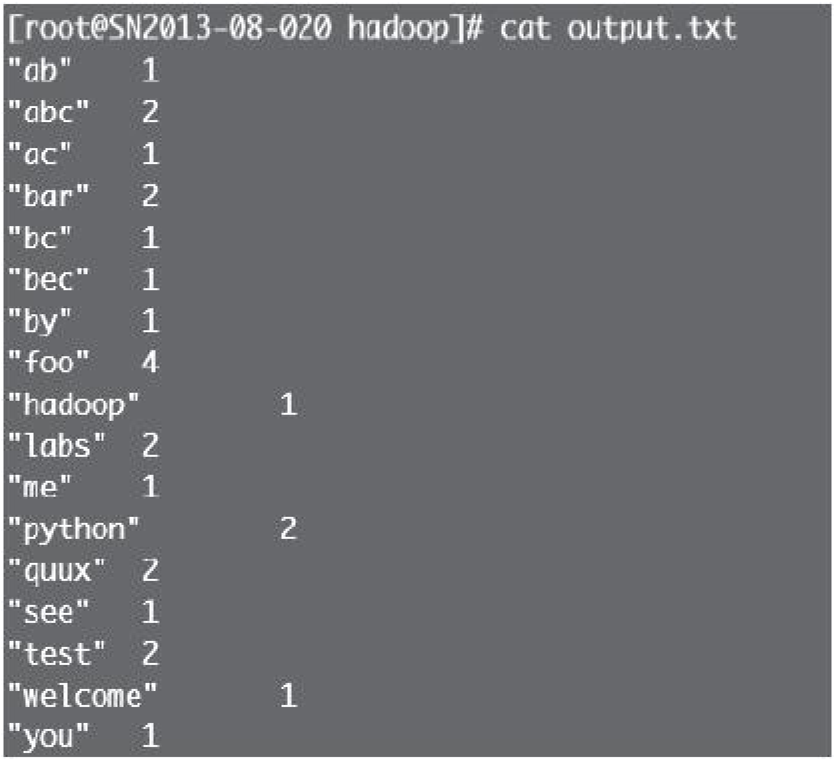
Hadoop□-r hadoop□□Amazon EMR□-r emr□□□□□□□□□□□□□□□□□

□1□□□□-r inline□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□-r inline□□□□□□□□□□□□“>output-file”□“-o output-file”□□□□□□□□□□□□

```
# python word_count.py -r inline input.txt >output.txt

# python word_count.py input.txt –o output.txt
```

□□□□output.txt□□□□12-10□



```
[root@SN2013-08-020 hadoop]# cat output.txt
"ab"    1
"abc"   2
"ac"    1
"bar"   2
"bc"    1
"bec"   1
"by"    1
"foo"   4
"hadoop"        1
"labs"  2
"me"    1
"python"        2
"quux"  2
"see"   1
"test"  2
"welcome"       1
"you"   1
```

□12-10 □□□□output.txt□□□□

□2□□□□-r local□□□

□□□□□□Hadoop□□□□□□□inline□□□□□□□□□□□□□□□□□□□□□□□

```
# python word_count.py -r local input.txt >output.txt
```

□□□□□□inline□□□□□□□□□□□□□□

□3□Hadoop□-r hadoop□□□

□□Hadoop□□□□□Hadoop□□□□□□□□□□□

·□□Hadoop□□□□□□□□VERY_HIGH|HIGH□□□□--jobconf mapreduce.job.priority=VERY_HIGH□

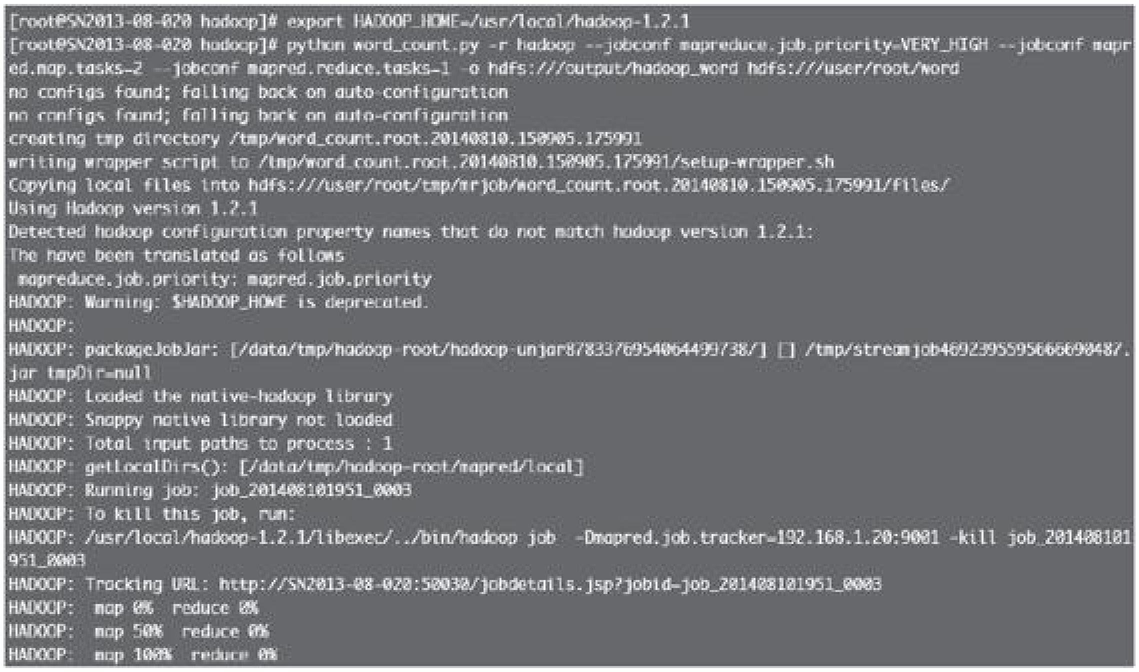
·Map□Reduce□□□□□□□□□--jobconf mapred.map.tasks=10--jobconf mapred.reduce.tasks=5□

□□□□□□□□□□□Hadoop□□□□□□□□□□□12-11□

□□http://192.168.1.20□50030/jobtracker.jsp□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□map□reduce□□□□□□12-12□□□

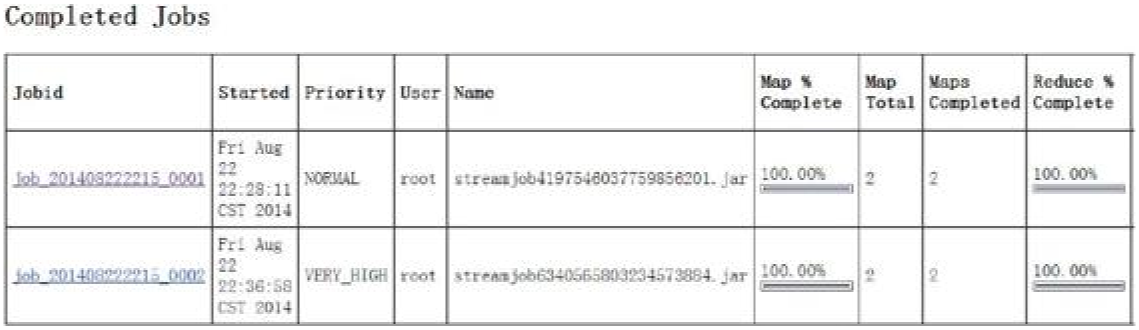
□□Hadoop□□□□□□□□□□□12-13□

Mrjob□□□□□□□□□□□□□□□□□□□□□□□□□



```
[root@SN2013-08-020 hadoop]# export HADOOP_HOME=/usr/local/hadoop-1.2.1
[root@SN2013-08-020 hadoop]# python word_count.py -r hadoop --jobconf mapreduce.job.priority=VERY_HIGH --jobconf mapr
ed.map.tasks=2 --jobconf mapred.reduce.tasks=1 -o hdfs:///output/hadoop_word hdfs:///user/root/word
no configs found; falling back on auto-configuration
no configs found; falling back on auto-configuration
creating tmp directory /tmp/word_count.root.20140810.150905.175991
writing wrapper script to /tmp/word_count.root.20140810.150905.175991/setup-wrapper.sh
Copying local files into hdfs:///user/root/tmp/mrjob/word_count.root.20140810.150905.175991/files/
Using Hadoop version 1.2.1
Detected hadoop configuration property names that do not match hadoop version 1.2.1:
The have been translated as follows
 mapreduce.job.priority: mapred.job.priority
HADOOP: Warning: $HADOOP_HOME is deprecated.
HADOOP:
HADOOP: packageJobJar: [/data/tmp/hadoop-root/hadoop-unjar8783376954064499738/] [] /tmp/streamjob4692395595666690487.
jar tmpDir=null
HADOOP: Loaded the native-hadoop library
HADOOP: Snappy native library not loaded
HADOOP: Total input paths to process : 1
HADOOP: getLocalDirs(): [/data/tmp/hadoop-root/mapred/local]
HADOOP: Running job: job_201408101951_0003
HADOOP: To kill this job, run:
HADOOP: /usr/local/hadoop-1.2.1/libexec/../bin/hadoop job  -Dmapred.job.tracker=192.168.1.20:9001 -kill job_201408101
951_0003
HADOOP: Tracking URL: http://SN2013-08-020:50030/jobdetails.jsp?jobid=job_201408101951_0003
HADOOP:  map 0%  reduce 0%
HADOOP:  map 50%  reduce 0%
HADOOP:  map 100%  reduce 0%
```

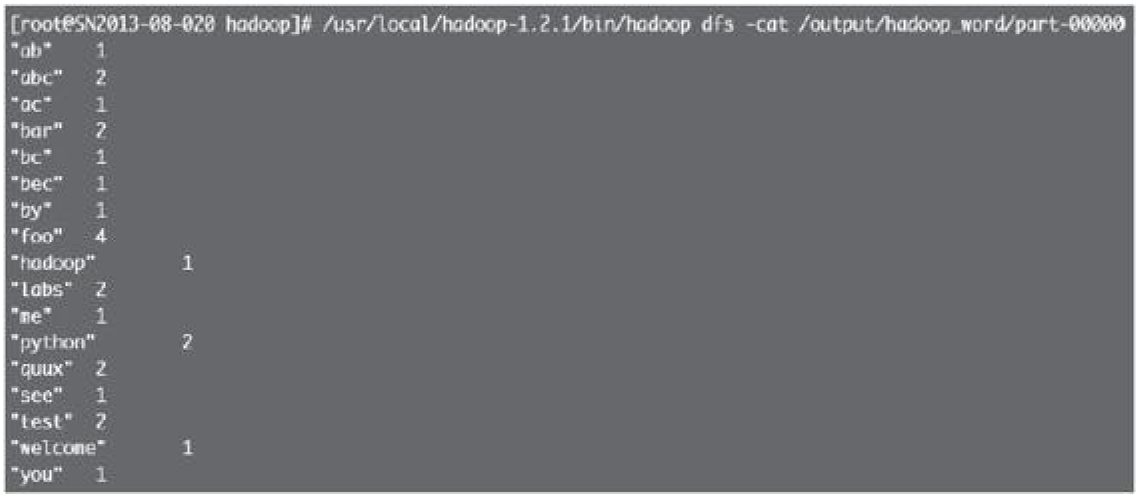
□12-11 □□□□□□□□□□□□



Completed Jobs

Jobid	Started	Priority	User	Name	Map % Complete	Map Total	Maps Completed	Reduce % Complete
Job_201408222215_0001	Fri Aug 22 22:28:11 CST 2014	NORMAL	root	streamjob4197546037759856201.jar	100.00%	2	2	100.00%
job_201408222215_0002	Fri Aug 22 22:36:58 CST 2014	VERY_HIGH	root	streamjob6340565803234573884.jar	100.00%	2	2	100.00%

□12-12 □□□□□□□□□□□□□



```
[root@SN2013-08-020 hadoop]# /usr/local/hadoop-1.2.1/bin/hadoop dfs -cat /output/hadoop_word/part-00000
"ab"	1
"abc"	2
"ac"	1
"bar"	2
"bc"	1
"bec"	1
"by"	1
"foo"	4
"hadoop"	1
"labs"	2
"me"	1
"python"	2
"quux"	2
"see"	1
"test"	2
"welcome"	1
"you"	1
```

[illegible]12-13 [illegible]

12.4 [illegible]

[illegible]Web[illegible]log[illegible]GB[illegible]shell[illegible]awk[illegible]GB[illegible]PB[illegible]Hadoop[illegible]Web[illegible]HTTP[illegible]IP[illegible]/[illegible]

12.4.1 [illegible]

[illegible]www.website.com[illegible]5[illegible]Web[illegible]/data/logs/[illegible]20140215[illegible]/access.log[illegible]Apache[illegible]

```
125.26.28.8 - - [01/Aug/2010[illegible]09[illegible]56[illegible]53 +0700] "GET
/teacher/jitra/image/pen.gif HTTP/1.1" 200 12014
"http[illegible]//www.kpsw.ac.th/teacher/jitra/page4.htm"
"Mozilla/4.0 [illegible]compatible[illegible] MSIE 8.0[illegible] Windows NT 5.1[illegible]
Trident/4.0[illegible] GTB6.5[illegible] InfoPath.1[illegible] .NET CLR 2.0.50727[illegible] yie8[illegible]"

125.26.28.8 - - [01/Aug/2010[illegible]09[illegible]56[illegible]53 +0700] "GET
/favicon.ico HTTP/1.1" 200 1187 "-" "Mozilla/4.0
[illegible]compatible[illegible] MSIE 8.0[illegible] Windows NT 5.1[illegible] Trident/4.0[illegible] GTB6.5[illegible]
InfoPath.1[illegible] .NETCLR 2.0.50727[illegible] yie8[illegible]"

66.249.65.37 - - [01/Aug/2010[illegible]09[illegible]57[illegible]59 +0700] "GET
/picture/49-02/DSC02630.jpg HTTP/1.1" 200 79220 "-"
"Googlebot-Image/1.0"

66.249.65.37 - - [01/Aug/2010[illegible]09[illegible]59[illegible]19 +0700] "GET
/elearning/index.php[illegible]cal_m=2&cal_y=2011 HTTP/1.1" 200 9232
```

```
"-" "Mozilla/5.0 □compatible□ Googlebot/2.1□
+http□//www.google.com/bot.html□"
```

□□12□□□□□□□□□□□□□□①□□□IP□②□□□□□□□□□□□③□□□□□□□□□□□□④□□□□□⑤UTC□□□⑥□□□⑦□□□⑧□□□⑨□□□□⑩□□□□□□⑪□□□□□⑫□□□□□□□□□□□□□□□

□□□□5□Web□□□□□HDFS□□□□□□□□□□□Web□□□HDFS□□□□□□□□□□□□□□□□□□□□JDK□□□□□□□□Hadoop□□□tar□□□□□□□□□□12.2□□□□□□□□□□□□□□□□crontab□□□□□□

```
55 23 * * * /usr/bin/python /home/test/hadoop/hdfsput.py >>
/dev/null 2>&1
```

□□subprocess.Popen□□□□□□Hadoop HDFS□□□□□□□□□□□HDFS□□□□□□□□□□□□□□□□□□

□/home/test/hadoop/hdfsput.py□

```
import subprocess

import sys

import datetime

webid="web1"  #HDFS□□□□□□□□□Web□□□□□□web2□web3□web4□web5

currdate=datetime.datetime.now□□.strftime□'%Y%m%d'□
```

```
logspath="/data/logs/"+currdate+"/access.log"  #□□□□□□

logname="access.log."+webid  #HDFS□□□□□

try□

    subprocess.Popen□["/usr/local/hadoop-1.2.1/bin/hadoop"□
"dfs"□ "-mkdir"□ "hdfs□//192.168.1.20□
9000/user/root/website.com/"+currdate]□
stdout=subprocess.PIPE□

#□□HDFS□□□□□□□□website.com/20140205

except Exception□e□

   pass

putinfo=subprocess.Popen□["/usr/local/hadoop-
1.2.1/bin/hadoop"□ "dfs"□ "-put"□ logspath□
"hdfs□//192.168.1.20□
9000/user/root/website.com/"+currdate+"/"+logname]□
stdout=subprocess.PIPE□  #□□□□□□□HDFS

for line in putinfo.stdout□

    print line
```

□crontab□□□□□□□□5□Web□□□□□□□HDFS□□□□□□□

```
# /usr/local/hadoop-1.2.1/bin/hadoop dfs -ls
/user/root/website.com/20140215

Found 5 items

-rw-r--r--   3 root supergroup  156541746 2014-02-15 23□55
/user/root/website.com/20140215/access.log.web1

-rw-r--r--   3 root supergroup  251245315 2014-02-15 23□53
/user/root/website.com/20140215/access.log.web2
```

```
-rw-r--r--   3 root supergroup  134256412 2014-02-15 23□55
/user/root/website.com/20140215/access.log.web3

-rw-r--r--   3 root supergroup  192314554 2014-02-15 23□54
/user/root/website.com/20140215/access.log.web4

-rw-r--r--   3 root supergroup  183267834 2014-02-15 23□55
/user/root/website.com/20140215/access.log.web5
```

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

12.4.2 □□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□CDN□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Mrjob□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□mapper□□□□Web□□□□□□□□□□□key□□□□□□□□□□□□□value□□reducer□□□□□□key□□□□sum□□□□□□□□□□□

□/home/test/hadoop/httpflow.py□

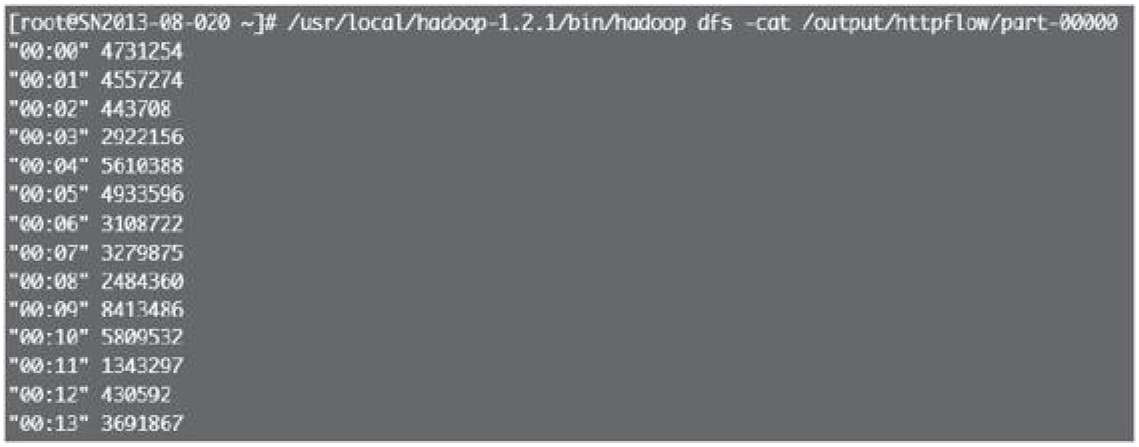
```
from mrjob.job import MRJob

import re

class MRCounter□MRJob□□

    def mapper□self□ key□ line□□

        i=0

        for flow in line.split□□□

            if i==3□  #□□□□□□□□□□□□□4□□□□□“[06/Aug/2010□03□
```

```
19□44”
                timerow= flow.split□"□"□
                hm=timerow[1]+"□"+timerow[2]  #□□“□□□□□”□□□
key
            if i==9 and re.match□r"\d{1□}"□ flow□□  #□□□□□
10□-□□□□□□□
            □□value
                yield hm□ int□flow□  #□□□key□value
            i+=1
    def reducer□self□ key□ occurrences□□
        yield key□ sum□occurrences□  #□□key“□□□□□”□value□□□
□□
if __name__ == '__main__'□
    MRCounter.run□□
```

□□Hadoop□□□□□□

```
# python /home/test/hadoop/httpflow.py -r hadoop --jobconf
mapreduce.job.priority=VERY_HIGH -o hdfs□///output/httpflow
hdfs□///user/root/website.com/20140215
```

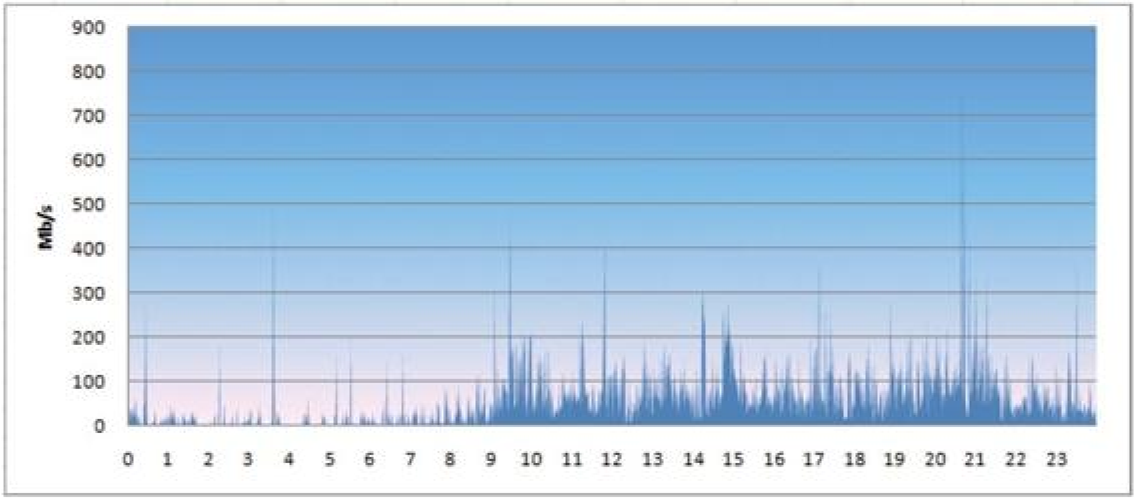
□□□□□□12-14□



```
[root@SN2013-08-020 ~]# /usr/local/hadoop-1.2.1/bin/hadoop dfs -cat /output/httpflow/part-00000
"00:00" 4731254
"00:01" 4557274
"00:02" 443708
"00:03" 2922156
"00:04" 5610388
"00:05" 4933596
"00:06" 3108722
"00:07" 3279875
"00:08" 2484360
"00:09" 8413486
"00:10" 5809532
"00:11" 1343297
"00:12" 430592
"00:13" 3691867
```

□12-14　□□□□□□□□□□□□

□□□□□□□□□□□□□MySQL□□□MySQL□□□□□□SQL□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□12-15□□□□□□□□□□□□



□12-15　□□□□□□□

12.4.3　□□HTTP□□□□□

□□□□□□□HTTP□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□200□404□5xx□□□□□□□□□□□□□

Mrjob□□□□□□□□□□□□□□□□□mapper□reducer□□□□□□□□□□□□□□□□□□steps□□□□□□□□□□□□□□□

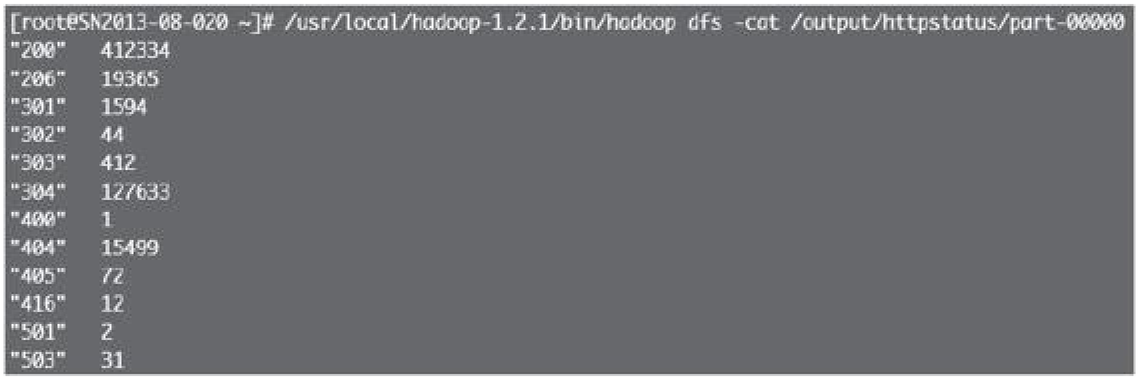
□/home/test/hadoop/httpstatus.py□

```
from mrjob.job import MRJob

import re

class MRCounter□MRJob□□

    def mapper□self□ key□ line□□

        i=0

        for httpcode in line.split□□□

            if i==8 and re.match□r"\d{1□3}"□ httpcode□□#□□□□
□□HTTP□□□□□□□key

                yield httpcode□ 1 #□□□key□value□value□□□1□□
□reducer□□□

            i+=1

    def reducer□self□ httpcode□ occurrences□□

        yield httpcode□ sum□occurrences□  #□□□□□key□□□value
□sum□□

    def steps□self□□

        return [self.mr□mapper=self.mapper□□  #□steps□□□□□□
□□□

                self.mr□reducer=self.reducer□]

if __name__ == '__main__'□

    MRCounter.run□□
```

□□hadoop□□□□□□□□□□□□□□□□□□□/output/httpstatus□□□□

```
# python /home/test/hadoop/httpstatus.py -r hadoop --
jobconf mapreduce.job.priority=VERY_HIGH -o
hdfs□///output/httpstatus
hdfs□///user/root/website.com/20140215
```

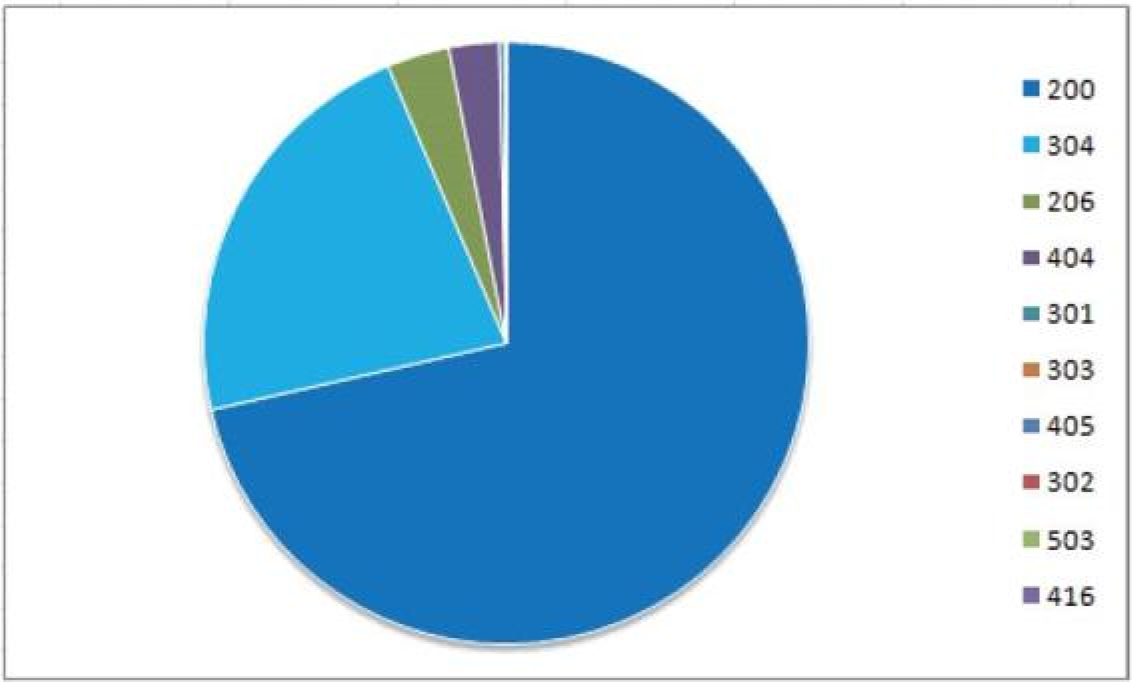
□□□□□□12-16□



```
[root@SN2013-08-020 ~]# /usr/local/hadoop-1.2.1/bin/hadoop dfs -cat /output/httpstatus/part-00000
"200"   412334
"206"   19365
"301"   1594
"302"   44
"303"   412
"304"   127633
"400"   1
"404"   15499
"405"   72
"416"   12
"501"   2
"503"   31
```

□12-16 □□□□□□

□□□□□□□□□□□□□□□□□□□12-17□□□



□12-17　□□HTTP□□□□□

12.4.4　□□□□□□□□□□

□□□12.4.2□□□□□□value□□□1□□□□□□□□□□□□□□□□

□/home/test/hadoop/http_minute_conn.py□

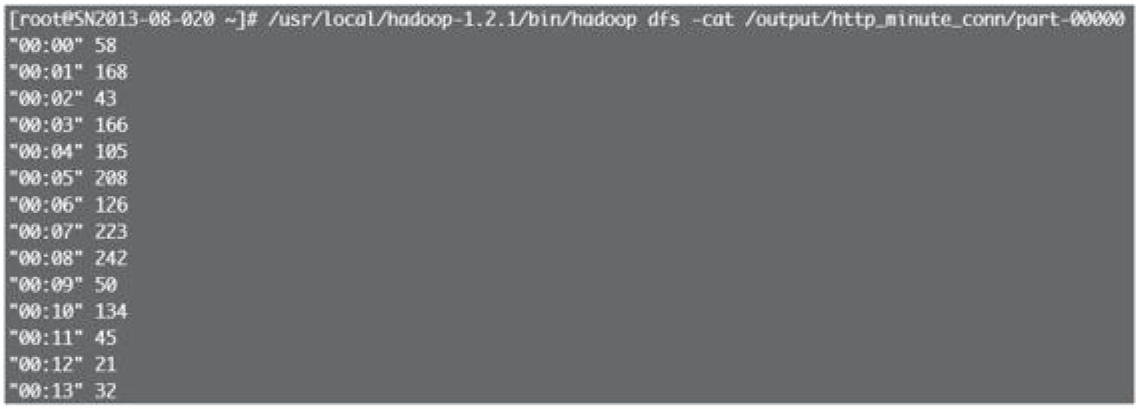
```
from mrjob.job import MRJob
import re
class MRCounter□MRJob□□
    def mapper□self□ key□ line□□
```

```
        i=0

        for dt in line.split□□□

            if i==3□   #□□□□□□□□□□□□□4□□□□□“[06/Aug/2010□
03□19□44”

                timerow= dt.split□"□"□

                hm=timerow[1]+"□"+timerow[2]  #□□“□□□□□”□□□
key

                yield hm□ 1  #□□□key□value□value□□□1□□□
reducer□□□

            i+=1

    def reducer□self□ key□ occurrences□□

        yield key□ sum□occurrences□

if __name__ == '__main__'□

    MRCounter.run□□
```

□□Hadoop□□□□□□ □/output/http_minute_conn□□□□

```
# python /home/test/hadoop/http_minute_conn.py -r hadoop --
jobconf mapreduce.job.priority=VERY_HIGH -o
hdfs□///output/http_minute_conn
hdfs□///user/root/website.com/20140215
```

□□□□□□12-18□



```
[root@SN2013-08-020 ~]# /usr/local/hadoop-1.2.1/bin/hadoop dfs -cat /output/http_minute_conn/part-00000
"00:00" 58
"00:01" 168
"00:02" 43
"00:03" 166
"00:04" 105
"00:05" 208
"00:06" 126
"00:07" 223
"00:08" 242
"00:09" 50
"00:10" 134
"00:11" 45
"00:12" 21
"00:13" 32
```

□12-18　□□□□□□□□□□□□

12.4.5　□□□□□□IP□□

□□□□□□□□□IP□□IP□□□□□□□key□□value□□□□1□□□reducer□□□□□□□sum□□□□□□□□□□□

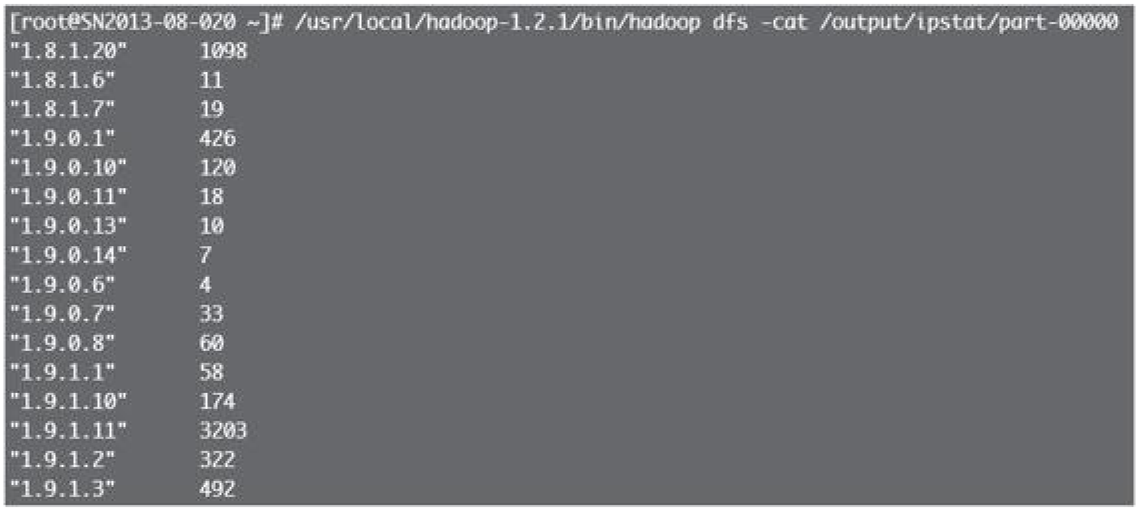
□/home/test/hadoop/ipstat.py□

```
from mrjob.job import MRJob

import re

IP_RE = re.compile□r"\d{1□3}\.\d{1□3}\.\d{1□3}\.\d{1□3}"□
#□□IP□□□□

class MRCounter□MRJob□□

    def mapper□self□ key□ line□□

        #□□IP□□□□□key□value□□□key□IP□□□value□□□□1

        for ip in IP_RE.findall□line□□

            yield ip□ 1
    def reducer□self□ ip□ occurrences□□

        yield ip□ sum□occurrences□

if __name__ == '__main__'□

    MRCounter.run□□
```

□□Hadoop□□□□□□□/output/ipstat□□□□

```
# python /home/test/hadoop/ipstat.py -r hadoop --jobconf
mapreduce.job.priority=VERY_HIGH -o hdfs□///output/ipstat
hdfs□///user/root/website.com/20140215
```

□□□□□12-19□



```
[root@SN2013-08-020 ~]# /usr/local/hadoop-1.2.1/bin/hadoop dfs -cat /output/ipstat/part-00000
"1.8.1.20"      1098
"1.8.1.6"       11
"1.8.1.7"       19
"1.9.0.1"       426
"1.9.0.10"      120
"1.9.0.11"      18
"1.9.0.13"      10
"1.9.0.14"      7
"1.9.0.6"       4
"1.9.0.7"       33
"1.9.0.8"       60
"1.9.1.1"       58
"1.9.1.10"      174
"1.9.1.11"      3203
"1.9.1.2"       322
"1.9.1.3"       492
```

□12-19　□□□□□□□□□□□

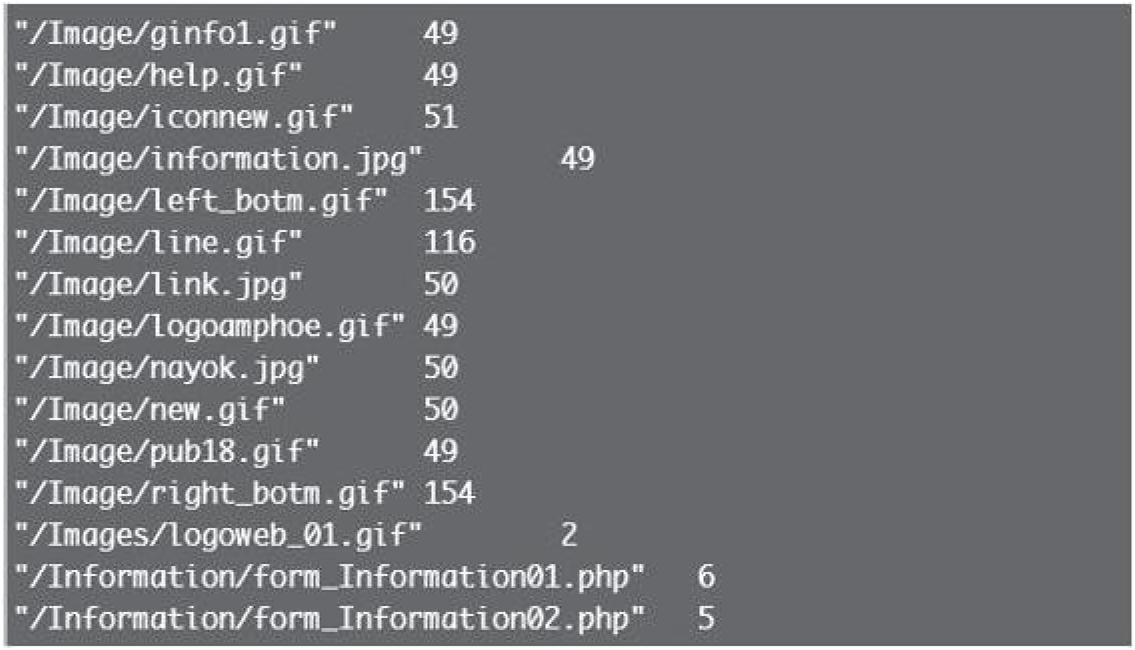
12.4.6　□□□□□□□□

□□cgi□□□□□□□□□□□□□□□□□□□□□□□□□□key□□□□value□1□□□reducer□□□□□sum□□□□□□□□□□□

□/home/test/hadoop/httpfile.py□

```
from mrjob.job import MRJob

import re

class MRCounter□MRJob□□

    def mapper□self□ key□ line□□

        i=0

        for url in line.split□□□

            if i==6□      #□□□□□URL□□□□□□□□□key

                yield url□ 1

            i+=1

    def reducer□self□ url□ occurrences□□

        yield url□ sum□occurrences□

if __name__ == '__main__'□

    MRCounter.run□□
```

□□□□□12-20□□□



```
"/Image/ginfo1.gif"     49
"/Image/help.gif"       49
"/Image/iconnew.gif"    51
"/Image/information.jpg"        49
"/Image/left_botm.gif"  154
"/Image/line.gif"       116
"/Image/link.jpg"       50
"/Image/logoamphoe.gif" 49
"/Image/nayok.jpg"      50
"/Image/new.gif"        50
"/Image/pub18.gif"      49
"/Image/right_botm.gif" 154
"/Images/logoweb_01.gif"        2
"/Information/form_Information01.php"   6
"/Information/form_Information02.php"   5
```

[illegible]12-20 [illegible]

[illegible]User-Agent[illegible]

[illegible] 12.2.1[illegible]Python[illegible] mapreduce[illegible]http://www.michael-noll.com/tutorials/writing-an-hadoop-mapreduce-program-in-python/[illegible]

□□□□　□□□

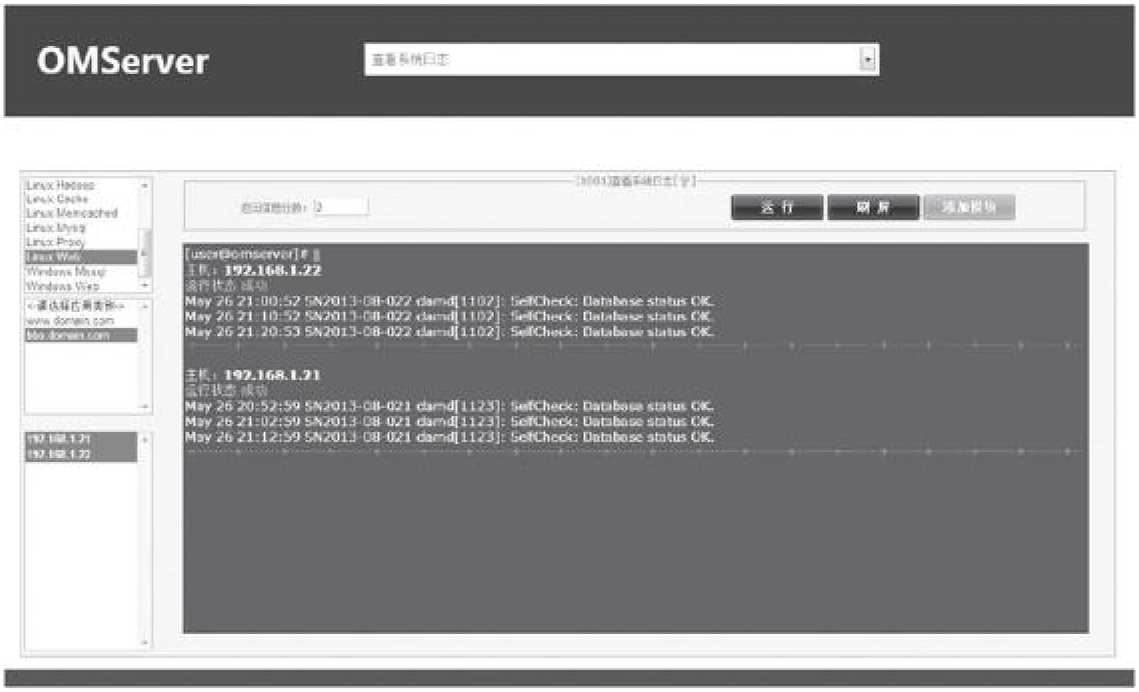
- ·□13□　□□□□□□B/S□□□□□□□
- ·□14□　□□Linux□□□□□□□□
- ·□15□　□□□□□□□□□□□
- ·□16□　□□□□□C/S□□□□□□□

[illegible]13[illegible] [illegible]B/S[illegible]

[illegible]“[illegible]”[illegible]“[illegible]”[illegible]IT[illegible]Python[illegible]

13.1 □□□□□□

□□ITIL□□□□□□□□□□□□□□□□ITIL□□□□□□□ OMServer□□□□□□□□□□□□□□□□□□□□□□□□□ OMServer□□□□□□□□□Linux□□□HTML□□□RC4□□□□□□□□□□□□□□□□□Web Server□□□Linux□□□□□□□□□□□□□□□□□□□□□□□□□□ OMServer□□□13-1□□□

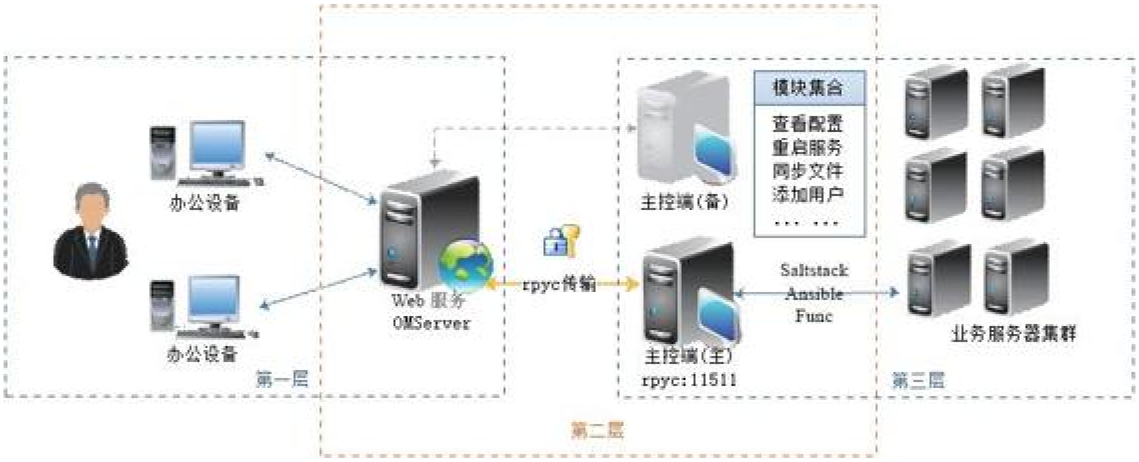


```
[user@omserver]#
主机：192.168.1.22
监控状态 成功
May 26 21:00:52 SN2013-08-022 clamd[1102]: SelfCheck: Database status OK.
May 26 21:10:52 SN2013-08-022 clamd[1102]: SelfCheck: Database status OK.
May 26 21:20:53 SN2013-08-022 clamd[1102]: SelfCheck: Database status OK.

主机：192.168.1.21
监控状态 成功
May 26 20:52:59 SN2013-08-021 clamd[1123]: SelfCheck: Database status OK.
May 26 21:02:59 SN2013-08-021 clamd[1123]: SelfCheck: Database status OK.
May 26 21:12:59 SN2013-08-021 clamd[1123]: SelfCheck: Database status OK.
```

□13-1 □□□□□□

13.2 □□□□□□

OMServer□□□□□□□□□□□□□□□□Web□□□□□□□Django+prototype.js+MySQL□□□□□□□□□□Nginx+uwsgi□□□□□Web□□□□□□□□□□□□□□□□rpyc□□□Saltstack□Ansible□Func□□□□□□□□□13-2□□□□□□□□□



□13-2 □□□□□

□□13-2□□□□□□□□□□□□□□□□□□OMServer□□□□Web□□□□□HTTP□□□OMServer□□HTTP POST□□□□□□“RC4+b64encode+□□key”□□□□□□□□rpyc□□□□rpyc□□□□□□□□□□□rpyc□□□□□□□□Saltstack□Ansible□Func□□□□□□□□□□□□□□□□□□“RC4+b64decode+□□key”□□□□□□□□OMServer□□□□□□□□□□Saltstack□Ansible□

Func□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

13.3 □□□□□□□

13.3.1 □□□□□

OMServer□□□□□□□□□□MySQL□□□□□□□□□□□□□□OMServer□□□□□□□□4□□□□□□□□□□□

·server_fun_categ□□□□□□□□□

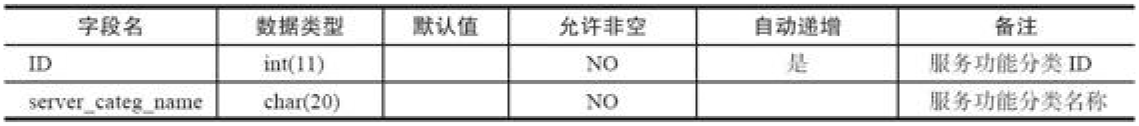
·server_app_categ□□□□□□□□□

·server_list□□□□□□□

·module_list□□□□□□

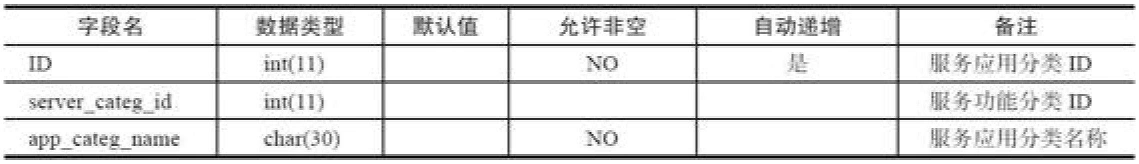
13.3.2 □□□□

server_fun_categ□□□□□□□□



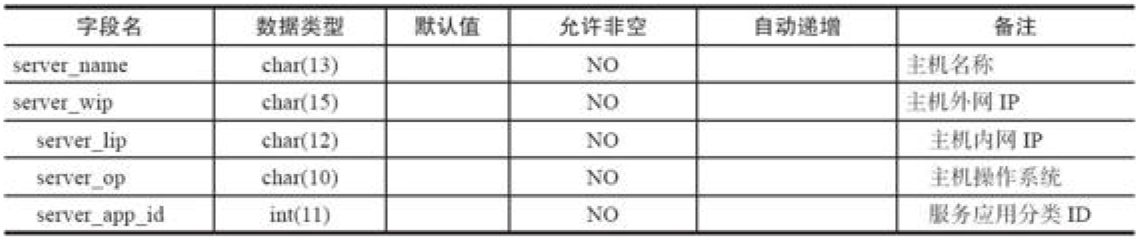
字段名	数据类型	默认值	允许非空	自动递增	备注
ID	int(11)		NO	是	服务功能分类 ID
server_categ_name	char(20)		NO		服务功能分类名称

server_app_categ□□□□□□□□



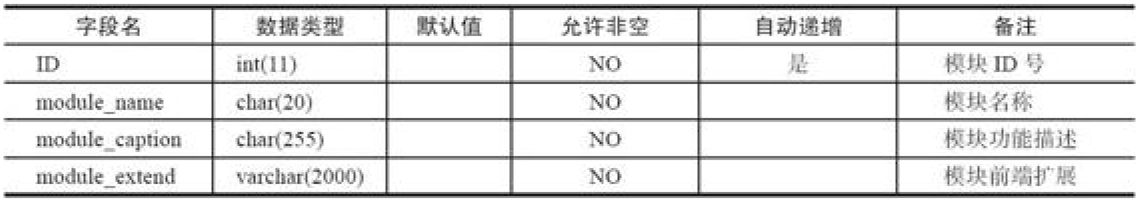
字段名	数据类型	默认值	允许非空	自动递增	备注
ID	int(11)		NO	是	服务应用分类 ID
server_categ_id	int(11)				服务功能分类 ID
app_categ_name	char(30)		NO		服务应用分类名称

server_list□□□□□□



字段名	数据类型	默认值	允许非空	自动递增	备注
server_name	char(13)		NO		主机名称
server_wip	char(15)		NO		主机外网 IP
server_lip	char(12)		NO		主机内网 IP
server_op	char(10)		NO		主机操作系统
server_app_id	int(11)		NO		服务应用分类 ID

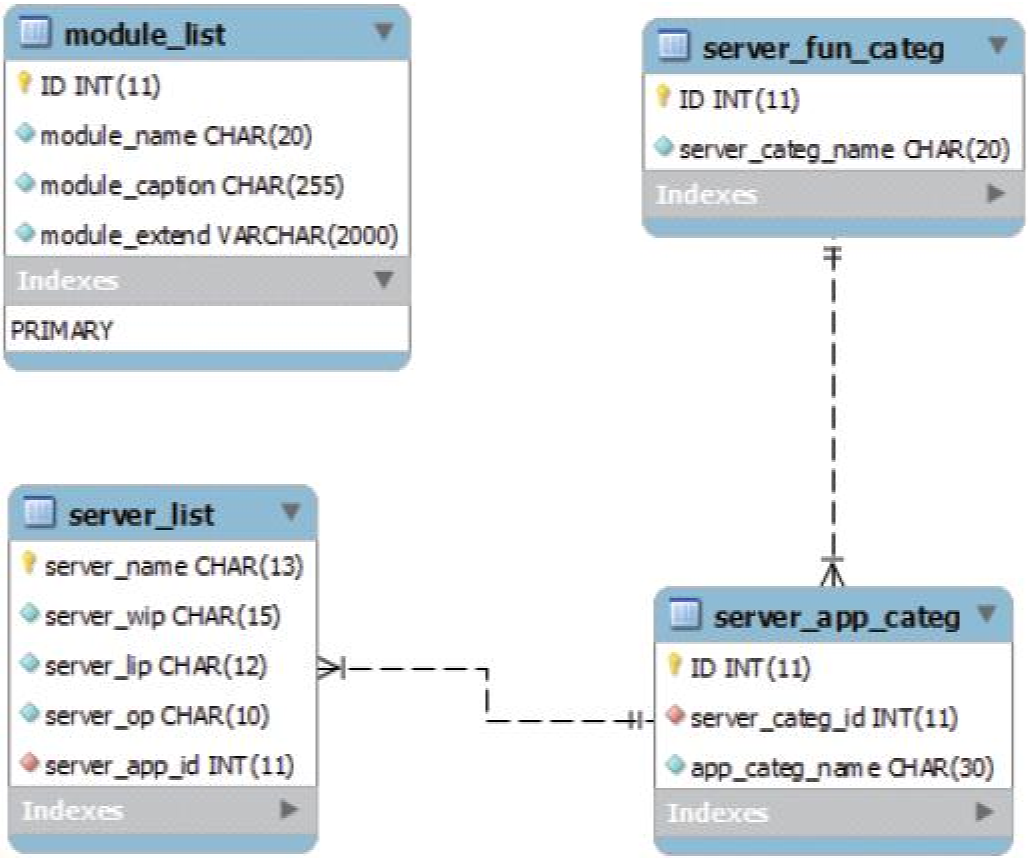
module_list[illegible]



字段名	数据类型	默认值	允许非空	自动递增	备注
ID	int(11)		NO	是	模块 ID 号
module_name	char(20)		NO		模块名称
module_caption	char(255)		NO		模块功能描述
module_extend	varchar(2000)		NO		模块前端扩展

13.3.3 [illegible]

[illegible]ITIL[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]“[illegible]”[illegible]Linux.Web[illegible]bbs.domain.com[illegible]10.11.100.10[illegible]bbs.domain.com[illegible]13-3[illegible]



[illegible]13-3 [illegible]

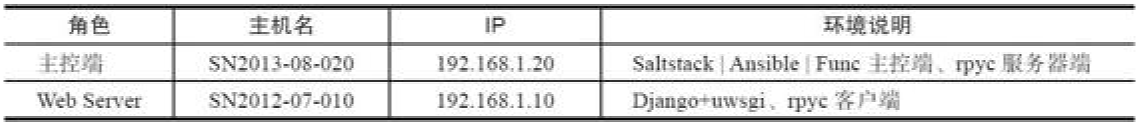
[illegible]server_list[illegible]server_app_id [illegible]server_app_categ[illegible]ID[illegible] [illegible]server_app_categ[illegible]server_categ_id[illegible] [illegible]server_fun_categ[illegible]ID[illegible]

13.4 [illegible]

13.4.1 [illegible]

OMServer[illegible]Django-1.4.9[illegible]nginx-1.5.9[illegible]uwsgi-2.0.4[illegible]rpyc-3.2.3[illegible]13-1[illegible]

[illegible]13-1 [illegible]



角色	主机名	IP	环境说明
主控端	SN2013-08-020	192.168.1.20	Saltstack | Ansible | Func 主控端、rpyc 服务器端
Web Server	SN2012-07-010	192.168.1.10	Django+uwsgi、rpyc 客户端

13.4.2 [illegible]

OMServer[illegible]Web[illegible]Django[illegible]rpyc[illegible]Saltstack[illegible]Ansible[illegible]Func[illegible]9~11[illegible]rpyc[illegible]

[illegible]1[illegible]Django[illegible]

[illegible]192.168.1.10[illegible]SN2012-07-010[illegible]

```
# cd /home

# mkdir -p /home/install/Django && cd
/home/install/Django    #[illegible]
```

```
# mkdir –p /data/logs/    #[illegible]uwsgi[illegible]
```

1[illegible]pcre[illegible]pcre[illegible]Nginx[illegible]HTTP Rewrite[illegible]8.34[illegible]OMServer[illegible]

```
# wget
ftp[illegible]//ftp.csx.cam.ac.uk/pub/software/programming/pcre/pcre-8.34.tar.gz

# tar -zxvf pcre-8.34.tar.gz

# cd pcre-8.34

#./configure

# make && make install

# cd ..
```

2[illegible]Nginx[illegible]Nginx[illegible]HTTP[illegible]1.5.9[illegible]

```
# wget http[illegible]//nginx.org/download/nginx-1.5.9.tar.gz

# tar -zxvf nginx-1.5.9.tar.gz

# cd nginx-1.5.9

#./configure --user=nobody --group=nobody --prefix=/usr/local/nginx --with-http_stub_status_module --with-cc-opt='-O3' --with-cpu-opt=opteron

# make && make install
# cd ..
```

3[illegible]MySQL-python[illegible]MySQL-python[illegible]Python[illegible]MySQL[illegible]1.2.3c1[illegible]

```
# yum install -y MySQL-python    #yum[illegible]

# wget http[illegible]//nchc.dl.sourceforge.net/project/mysql-python/mysql-python/1.2.2/

# tar -zxvf MySQL-python-1.2.2.tar.gz    #[illegible]

# cd MySQL-python-1.2.2

# python setup.py install

# cd ..
```

4[illegible]uwsgi[illegible]uwsgi[illegible]C[illegible]WSGI[illegible]Python Web[illegible]2.0.4[illegible]

```
# wget http[illegible]//projects.unbit.it/downloads/uwsgi-2.0.4.tar.gz

# tar -zxvf uwsgi-2.0.4.tar.gz

# cd uwsgi-2.0.4

# make

# cp uwsgi /usr/bin
# cd ..
```

5□□□Django□Django□□□Python□□□□□Web□□□□□□□□□□1.6.5□□□□□□□□□□□□□□□□1.4.9□□□□□□□

```
# wget https□//www.djangoproject.com/m/releases/1.4/Django-1.4.9.tar.gz

# tar -zxvf Django-1.4.9.tar.gz

# cd Django-1.4.9

# python setup.py install
```

6□□□Nginx□□□/usr/local/nginx/conf/nginx.conf□□□□□server□□□□

```
    server {

        listen 80□

        server_name omserver.domain.com□

        location / {

            uwsgi_pass 192.168.1.10□9000□

            include uwsgi_params□

            uwsgi_param UWSGI_CHDIR  /data/www/OMserverweb□

            uwsgi_param UWSGI_SCRIPT django_wsgi□
            access_log off□

        }

        location ^~ /static {

            root /data/www/OMserverweb□

        }

        location ~* ^.+\.
□mpg|avi|mp3|swf|zip|tgz|gz|rar|bz2|doc|xls|exe|ppt|txt
|tar|mid|midi|wav|rtf|mpeg□$ {

            root /data/www/OMserverweb/static□

            access_log off□

        }

    }
```

□□“omserver.domain.com”□□□□□□□□“/data/www/OMserverweb”□□□□□□□□□□□□□□□□□□□□

7□□□uwsgi□□□uwsgi□□□□/usr/local/nginx/conf/uwsgi.ini□□□□□□□□

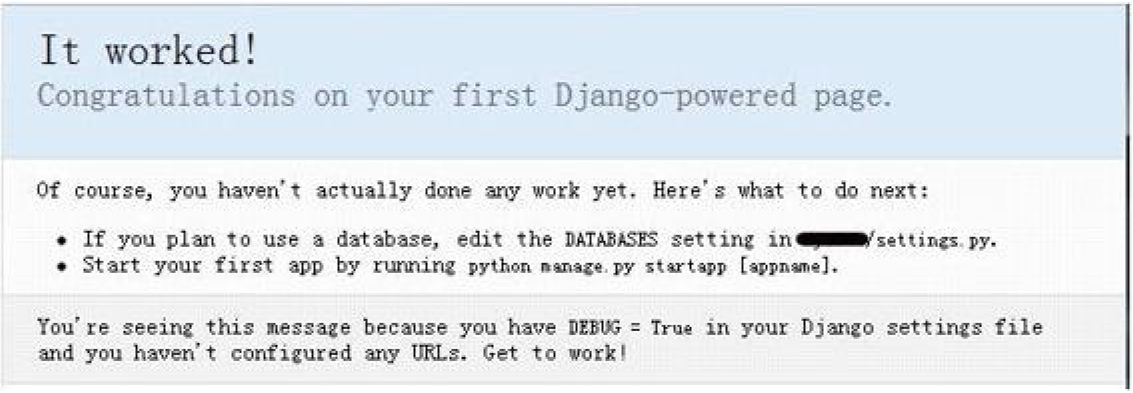
```
[uwsgi]

socket = 0.0.0.0□9000    #□□□□□□□□

master = true    #□□□□□

pidfile = /usr/local/nginx/uwsgi.pid

processes = 8    #uwsgi□□□□□□
```

```
chdir = /data/www/OMserverweb    #□□□□□

pythonpath = /data/www

profiler=true

memory-report=true

enable-threads = true

logdate=true

limit-as=6048

daemonize=/data/logs/django.log
```

□□uwsgi□nginx□□□

```
# /usr/bin/uwsgi --ini /usr/local/nginx/conf/uwsgi.ini

# /usr/local/nginx/sbin/nginx
```

□□http://omserver.domain.com□□□□□4-4□□□□□□□Django+uwsgi□□□□□□□



It worked!

Congratulations on your first Django-powered page.

Of course, you haven't actually done any work yet. Here's what to do next:

- If you plan to use a database, edit the DATABASES setting in [redacted]/settings.py.
- Start your first app by running python manage.py startapp [appname].

You're seeing this message because you have DEBUG = True in your Django settings file and you haven't configured any URLs. Get to work!

□13-4 Django□□□□

□2□rpyc□□□□□

rpyc□Remote Python Call□□Python□□□□□□□□□□□□□□□□□□□□□□□□□□□Socket□□□□□□□□3.3□□□□□□□□rpyc□□□□□□192.168.1.20□SN2013-08-020□□192.168.1.10□SN2012-07-010□□

```
# wget https□//pypi.python.org/packages/source/r/rpyc/rpyc-3.2.3.tar.gz --no-check-certificate

# tar -zxvf rpyc-3.2.3.tar.gz

# cd rpyc-3.2.3

# python setup.py install
```

13.4.3 □□□□□□

□□Django□□□□□□

django-debug-toolbar□□□□□□□□□□□□□□□□Django□□□□□□□□□□□□

□1□django-debug-toolbar□□□

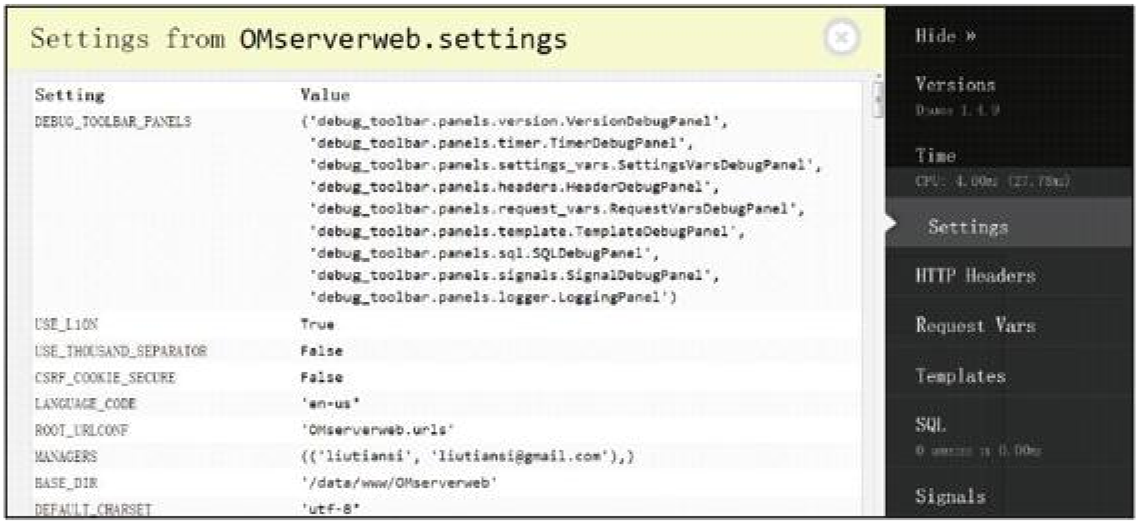
```
# wget https□//github.com/robhudson/django-debug-
toolbar/archive/master.zip

# unzip master

# cd django-debug-toolbar-master/

# python setup.py install
```

□□Django□setting.py□□□□□□□□□□

```
INTERNAL_IPS = □'127.0.0.1'□'192.168.1.101'□□    #□□□□□□□□□
□IP

MIDDLEWARE_CLASSES = □    # MIDDLEWARE_CLASSES□□□□□

    … …

    'debug_toolbar.middleware.DebugToolbarMiddleware'□

□

INSTALLED_APPS = □    # INSTALLED_APPS□□□□□

    … …

    'debug_toolbar'□

}

TEMPLATE_DIRS = □    #TEMPLATE_DIRS□□□□□□□□□python□□□□□□□□□

    … …
```

```
'/usr/lib/python2.6/site-packages/django_debug_toolbar-0.8.5-py2.6.egg/debug_toolbar/templates/'□

□
```

□□□□□□□□□□□□□debug_toolbar□□□□□□□□□□□□□□□□□□□□□□□□debug_tool□□□□debug_toolbar□□□□□□□□□□□□□□□□□□□□□□□□□□□13-5□□□



Settings from OMserverweb.settings

Setting	Value
DEBUG_TOOLBAR_PANELS	('debug_toolbar.panels.version.VersionDebugPanel', 'debug_toolbar.panels.timer.TimerDebugPanel', 'debug_toolbar.panels.settings_vars.SettingsVarsDebugPanel', 'debug_toolbar.panels.headers.HeaderDebugPanel', 'debug_toolbar.panels.request_vars.RequestVarsDebugPanel', 'debug_toolbar.panels.template.TemplateDebugPanel', 'debug_toolbar.panels.sql.SQLDebugPanel', 'debug_toolbar.panels.signals.SignalDebugPanel', 'debug_toolbar.panels.logger.LoggingPanel')
USE_L10N	True
USE_THOUSAND_SEPARATOR	False
CSRF_COOKIE_SECURE	False
LANGUAGE_CODE	'en-us'
ROOT_URLCONF	'OMserverweb.urls'
MANAGERS	(('liutiansi', 'liutiansi@gmail.com'),)
BASE_DIR	'/data/www/OMserverweb'
DEFAULT_CHARSET	'utf-8'

□13-5　debug_toolbar□□

□2□Django□□□□□□□reload□□□

□□□□□uwsgi□“--touch-reload”□□□□□□□□□□□□--touch-reload"□□"□□□□□□□□□□□□□□□□□□□□□touch□□□□□uwsgi□□□□□□□□reload□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□--

touch-reload□□□□□□Linux□□□□inotify□□□□□□□□□□□□□□

1□□□□□□□□□□□□□□□□

```
# mkdir /data/www/OMserverweb/shell    #□□□□□□□□□□□□□□□□□□□shell

# touch reload.set    #□□□□□□□□reload.set

# yum -y install inotify-tools    #□□inotify□□□

# uwsgi□□□□□□“--touch-reload”□

# /usr/bin/uwsgi --ini "/usr/local/nginx/conf/*.ini" --touch-reload "/data/www/OMserverweb/shell/reload.set"
```

2□□□□□□□□

```
# vi /data/www/OMserverweb/shell/autoreload.sh

#□/bin/sh

objectdir="/data/www/OMserverweb"

# □□inotify□□□□□□□□□“--exclude”□□□□□□□□□□□

/usr/bin/inotifywait -mrq --exclude "□static|logs|shell|\.swp|\.swx|\.pyc|\.py\~□" --timefmt '%d/%m/%y %H□%M' --format '%T %w%f' --event     modify□delete□move□create□attrib ${objectdir} | while read files

do

#□□□□□□□□□□□□touch reload.net□□□□□□□uwsgi□□□□□□□□□□□□□□□□

/bin/touch /data/www/OMserverweb/shell/reload.set
```

```
    continue

done &
```

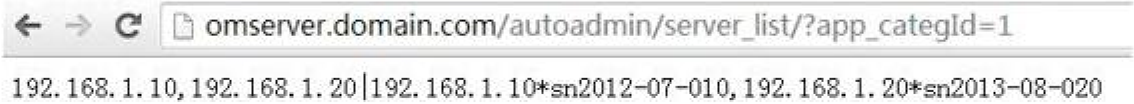
3[illegible]

```
# /data/www/OMserverweb/shell/autoreload.sh
```

13.5 □□□□□□□□□

13.5.1 □□□□□□□□□

OMServer□□□Web□□□□prototype.js□□□□Ajax□□□□□get□□□□□□□Django□□□□□□□□□□□□□HttpResponse□□□□□□□□□□□□□□□□□□□□□□□□□□□13-6□□□ID□app_categId□□□1□HttpResponse□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

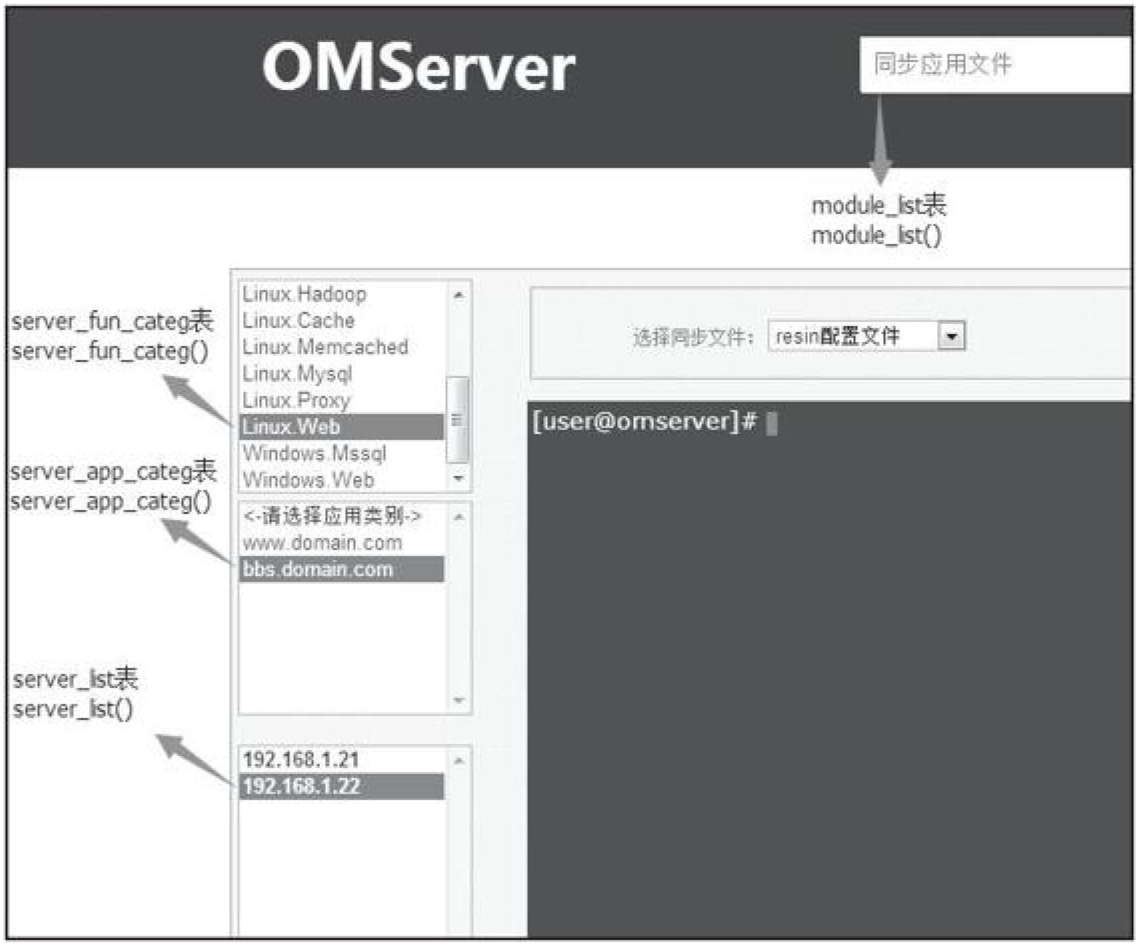


omserver.domain.com/autoadmin/server_list/?app_categId=1

```
192.168.1.10,192.168.1.20|192.168.1.10*sn2012-07-010,192.168.1.20*sn2013-08-020
```

□13-6 □□□□□□□□

□□□□□□□□□□□□□□□□□□□13-7□



```
[user@omserver]#
```

[illegible]13-7 [illegible]

[illegible]

[illegible]/data/www/OMserverweb/autoadmin/views.py[illegible]

```
"""
=Return server IP list
=[illegible]
"""
```

```
def server_list□request□□

    ip=""

    ip_hostname=""

    if not 'app_categId' in request.GET□

        app_categId=""

    else□

        app_categId=request.GET['app_categId']    #□□□□□□□□
□□□ID

    #ServerList□server_list□□□□□□□□□□□□□□□□□ID□□□□□□□□

    ServerListObj = ServerList.objects.filter
□server_app_id=app_categId□

    for e in ServerListObj□

        ip+="□"+e.server_lip

        ip_hostname+="□"+e.server_lip+"*"+e.server_name

    server_list_string=ip[1□]+"|"+ip_hostname[1□]

    # □□□□□192.168.1.10□192.168.1.20|192.168.1.10*sn2012-
07-010□\

    #192.168.1.20*sn2013-08-020□□□“|”□□□□□□□IP□□□□□HTML
<option>

     □□□□□□□

    #□□□□□□□<option>□value□□“*”□□□□□□□□□□□□□□□□□□□IP□□

     □□□□□□

    return HttpResponse□server_list_string□

"""

=Return module list
```

```
=□□□□□□□□□□
"""
def module_list□request□□
    module_id="-1"
    module_name=u"□□□□□□□..."
    # ModuleList□module_list□□□□□□□□□□□□□□□□□□□□id□□□
    ModuleObj = ModuleList.objects.order_by□'id'□
    for e in ModuleObj□
        module_id+="□"+str□e.id□
        module_name+="□"+e.module_name
    module_list_string=module_name+"|"+module_id
    #□□□□□“□□□□□□□...□□□□□□□□□□□□□□□□□□□□□|-1□1001□1002□
1003”
    #□□“|”□□□□□□□□□□ID□Web□□□□□□□□□JavaScript□□□□□□
    return HttpResponse□module_list_string□
```

13.5.2 □□□□□□□□

□□□□□□rpyc□□rpyc□□□□□□□□□□Server□□□□□□Client□□□□□□Socket□□□□□□□□□□rpyc□□Server□Client□□□□Python□□□□□□□□□□□□□□□□□□□□□□Django□

module_run□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/data/www/OMserverweb/autoadmin/views.py□

```
"""
= Run module
= □□□□□□□□□□rpyc□□□□□□□□□□□
"""
def module_run□request□□
    import rpyc
    put_string=""
    if not 'ModuleID' in request.GET□    #□□□□ID□□□□□□□□□□□
□□□□□□□□□□□
        Module_Id=""
    else□
        Module_Id=request.GET['ModuleID']
        put_string+=Module_Id+"@@"
        ……
    try□
        conn=rpyc.connect□'192.168.1.20'□11511□   #□□rpyc□□
□□□□□□□11511
        #□□rpyc Server□login□□□□□□□□□□□□□□□□□□□
        conn.root.login
```

```
□'OMuser'□'KJS23o4ij09gHF734iuhsdfhkGYSihoiwhj38u4h'□

    except Exception□e□

        logger.error□'connect rpyc server error□'+str□e□□

        return HttpResponse□'connect rpyc server
error□'+str□e□□

    #□□□□□□□□tencode□□□□□□□□□□□Django □settings.SECRET_KEY□
□

    put_string=tencode□put_string□settings.SECRET_KEY□

    #□□rpyc Server□Runcommands□□□□□□□□□□□□□□□□□□□□□tdecode□
□□□

    OPresult=tdecode□conn.root.Runcommands□put_string□□
settings.SECRET_KEY□

    return HttpResponse□OPresult□    #□□□□□□□□□
```

□□rpyc□□□□□□□□□□□□□□rpyc□□□□□□□□□□□□□□□□□□□□□□ID□□□□□□□□□□□□□□□□□□□exec□□□Web□□□□□□□□□□□

□/home/test/OMServer/OMservermain.py□

```
# -*- coding□ utf-8 -*-

import time

import os□sys

import re
```

```
from cPickle import dumps

from rpyc import Service

from rpyc.utils.server import ThreadedServer

import logging

from libraries import *

from config import *

#□□□□□□□□□□□□

sysdir=os.path.abspath□os.path.dirname□__file__□□

sys.path.append□os.sep.join
□□sysdir□'modules/'+AUTO_PLATFORM□□□

class ManagerService□Service□□

    #□□login□□□□□□□□□□□□□□□rpyc□□□□“ exposed_”□□□□□□□□

    # login□□□□

    def exposed_login□self□user□passwd□□

        if user=="OMuser" and
passwd=="KJS23o4ij09gHF734iuhsdfhkGYSihoiwhj38u4h"□

            self.Checkout_pass=True    #□□□□□□□□□□□“True”□□
□□□□□□

                                       #□□□□

        else□

            self.Checkout_pass=False

    def exposed_Runcommands□self□get_string□□

        logging.basicConfig□level=logging.DEBUG□    #□□□□□□
□□

                    format='%□asctime□s [%□levelname□s] %
```

```
□message□s'□

                    filename=sys.path[0]+'/logs/omsys.log'□

                    filemode='a'□

        #□□□□□□□□

        try□

            if self.Checkout_pass□=True□

                return tencode□"User verify failed□"□
SECRET_KEY□

        except□

                return tencode□"Invalid Login□"□SECRET_KEY□

        #□□rpyc Client□□□□get_string□□□tdecode□□□□□□□□□□□□□
□□“@@”

        self.get_string_array=tdecode□get_string□
SECRET_KEY□.split□'@@'□

        self.ModuleId=self.get_string_array[0]    #□□□□□□ID

        self.Hosts=self.get_string_array[1]    #□□□□□□□□

        sys_param_array=[]    #□□□□□□□□□□□□□□□□□

        for i in range□2□len□self.get_string_array□-1□□

            sys_param_array.append
□self.get_string_array[i]□

        #□□□□ID□□□□□□□□□□“Mid_”+□□ID□□“Mid_1001.py”

        mid="Mid_"+self.ModuleId

        importstring = "from "+mid+" import Modulehandle"

        try□

            exec importstring
        except□

            return tencode□u"module\""+mid+u"\"does not
exist□ Please add

it"□SECRET_KEY□

        #□□□□□□□□□□□□□□□

        Runobj=Modulehandle□self.ModuleId□self.Hosts□
sys_param_array□

        Runmessages=Runobj.run□□

        #□□□□□□□□□□□□□□□□□Func□Ansible□Saltstack

        if AUTO_PLATFORM=="func"□

            if type□Runmessages□ == dict□

                returnString = func_transform□Runmessages□
self.Hosts□

            else□

                returnString = str□Runmessages□.strip□□

        elif AUTO_PLATFORM=="ansible"□

            if type□Runmessages□ == dict□

                returnString = ansible_transform
□Runmessages□self.Hosts□

            else□

                returnString = str□Runmessages□.strip□□

        elif AUTO_PLATFORM=="saltstack"□

            if type□Runmessages□ == dict□

                returnString = saltstack_transform
□Runmessages□self.Hosts□
```

```
            else□

                returnString = str□Runmessages□.strip□□

        #□□□□rpyc Client□□□□□□□□

        return tencode□returnString□SECRET_KEY□

s=ThreadedServer□ManagerService□port=11511□
auto_register=False□

s.start□□    #□□rpyc□□□□□□□□□□□□
```

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□OMServer□□□□base64.b64encode□□□base64.b64decode□□□□□□□□□□□RC4□□□□□□□□□□□□OMServer□□□□□□□□□□□□□□□□□□tencode□□□□□□□□□□□□□□□□□□□dencode□□□□□□□□□□□□□□□□□□settings.py□□SECRET_KEY□□□□□□□rpyc□□□□□□login□□□□□□□□□□□□□□□□

□/home/test/OMServer/libraries.py□

```
# -*- coding□ utf-8 -*-

#□/usr/bin/env python

import random□ base64

from hashlib import sha1

#RC4□□□□

def crypt□data□ key□□
```

```
    x = 0

    box = range□256□

    for i in range□256□□

        x = □x + box[i] + ord□key[i % len□key□]□□ % 256

        box[i]□ box[x] = box[x]□ box[i]

    x = y = 0

    out = []

    for char in data□

        x = □x + 1□ % 256

        y = □y + box[x]□ % 256

        box[x]□ box[y] = box[y]□ box[x]

        out.append□chr□ord□char□ ^ box[□box[x] + box[y]□ % 256]□□

    return ''.join□out□

#□□RC4□□□□□□□□□□□data□□□□□□□key□□□

def tencode□data□ key□ encode=base64.b64encode□ salt_length=16□□

    """RC4 encryption with random salt and final encoding"""

    salt = ''

    for n in range□salt_length□□

        salt += chr□random.randrange□256□□

    data = salt + crypt□data□ sha1□key + salt□.digest□□□

    if encode□
```

```
        data = encode□data□

    return data

#□□RC4□□□□□□□□□□□data□□□□□□□key□□□

def tdecode□data□ key□ decode=base64.b64decode□
salt_length=16□□

    if decode□

        data = decode□data□

    salt = data[□salt_length]

    return crypt□data[salt_length□]□ sha1□key +
salt□.digest□□□
```

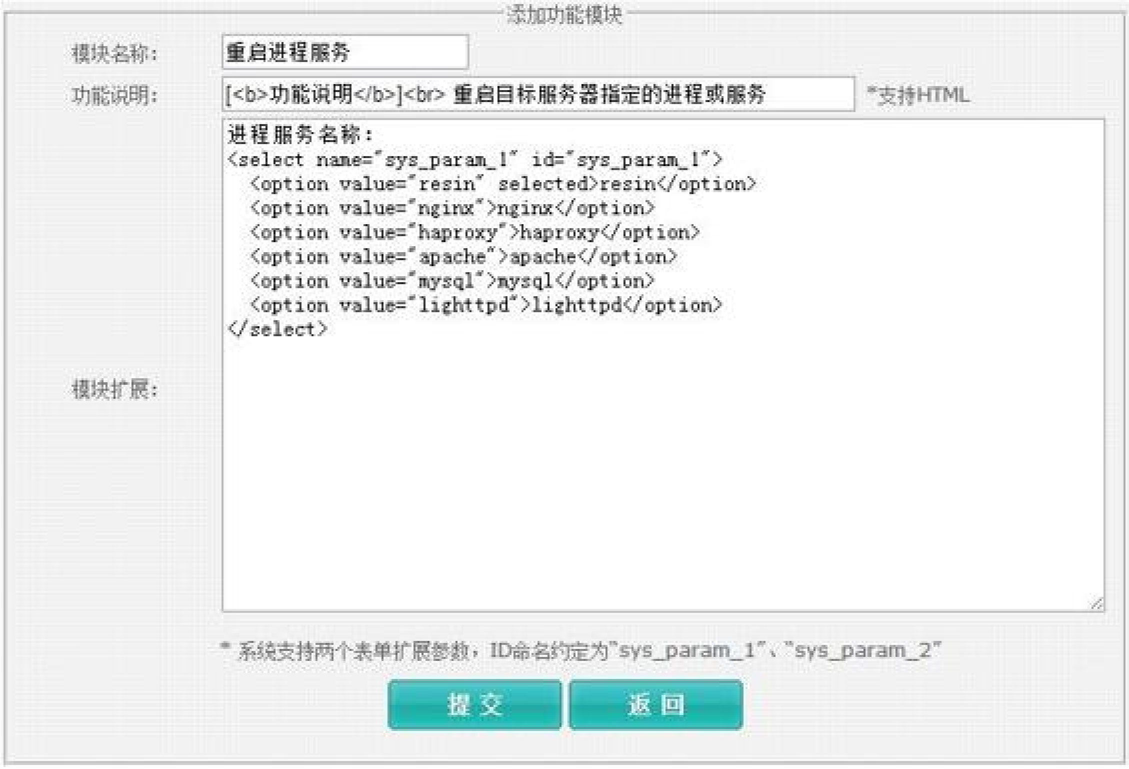
13.5.3 □□□□□□□□

OMServer□□

□1□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□HTML□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□“□□□□”□□□□□□□□□□□□“□□□□”□□□□□□□□HTML□□□□□□□□□name□□□□□□□value□□OMServer□□□□□□□□□□□□□name□□□□□□“sys_param_1”□“sys_param_2”□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□“□□□□□□”□□□□□□□□□13-8□□□

□□□□□□□□□□□ID□□□□ID□□□□□□□□□□□□□□□□
□□□□13-9□□□□□□□ID“1007”□□□□□□□□□□



添加功能模块

模块名称：重启进程服务

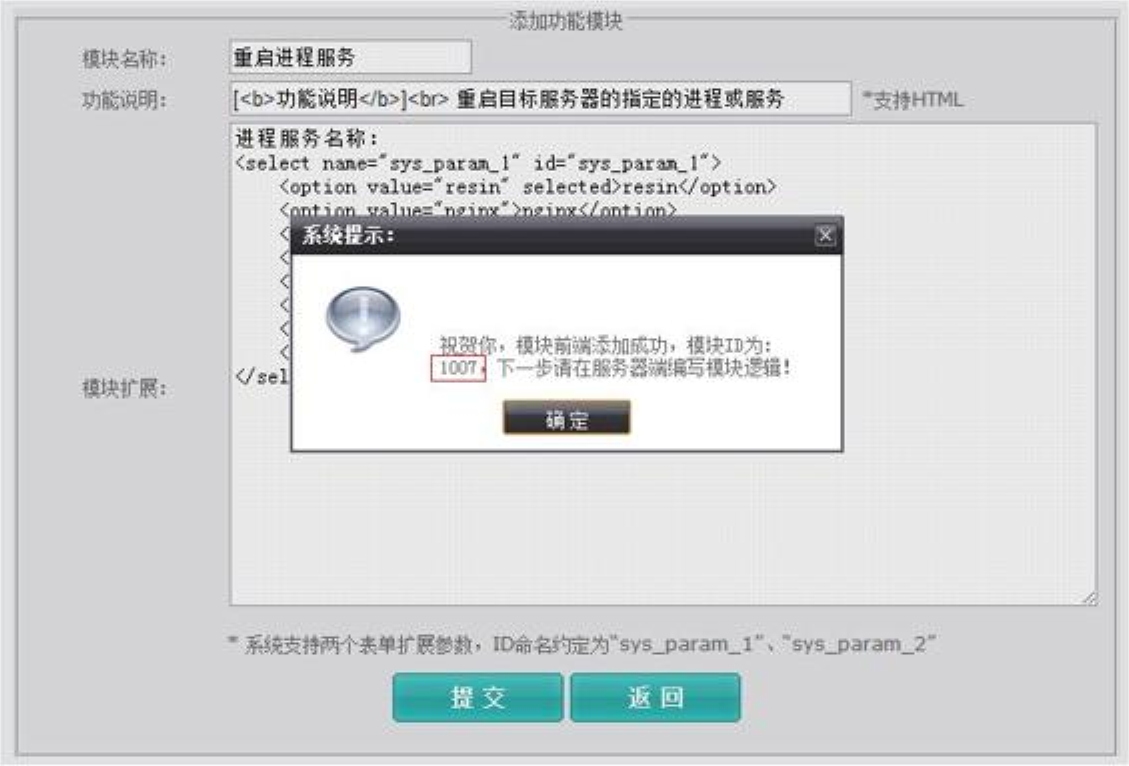
功能说明：[<b>功能说明</b>]
 重启目标服务器指定的进程或服务

模块扩展：

```
进程服务名称：
<select name="sys_param_1" id="sys_param_1">
  <option value="resin" selected>resin</option>
  <option value="nginx">nginx</option>
  <option value="haproxy">haproxy</option>
  <option value="apache">apache</option>
  <option value="mysql">mysql</option>
  <option value="lighttpd">lighttpd</option>
</select>
```

* 系统支持两个表单扩展参数，ID命名约定为"sys_param_1"、"sys_param_2"

□13-8 □□□□□



模块名称： 重启进程服务

功能说明： [<b>功能说明</b>]
 重启目标服务器的指定的进程或服务 *支持HTML

模块扩展：

```
进程服务名称：
<select name="sys_param_1" id="sys_param_1">
     <option value="resin" selected>resin</option>
     <option value="nginx">nginx</option>
     <
     <
     <
     <
     <
     <
</sel
```

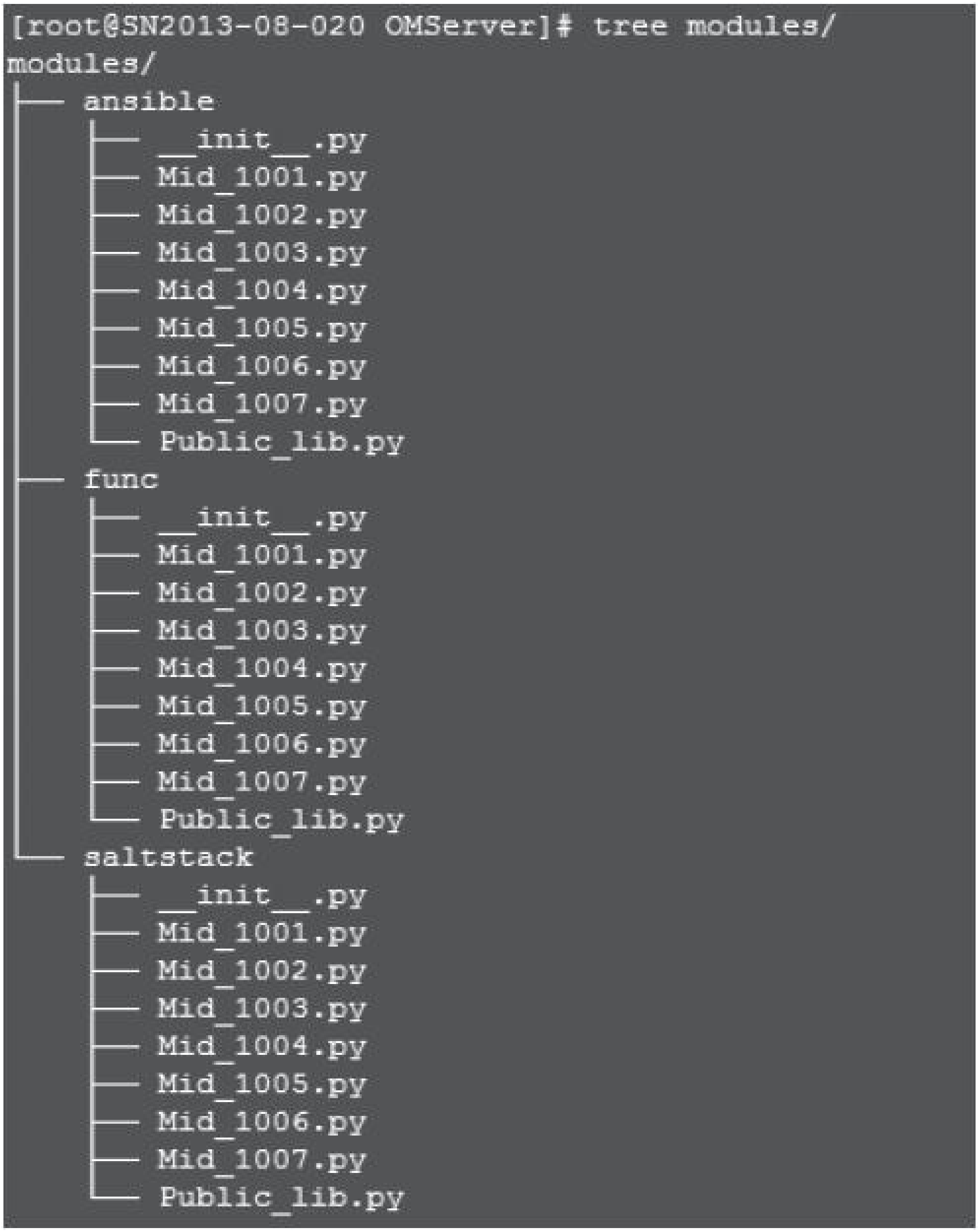
祝贺你，模块前端添加成功，模块ID为：1007，下一步请在服务器端编写模块逻辑！

* 系统支持两个表单扩展参数，ID命名约定为"sys_param_1"、"sys_param_2"

□13-9　□□□□□□□□

□2□□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□3□Python□□□□□□□□□□Saltstack□Ansible□Func□□□□□□API□□□□□□□□□□□□□□□□OMServer□□□□□□□□□□□□□□□□□□□□□□□□□□□□13-10□□□□□□□□□modules□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□“Mid_”+□□ID□□□□□□□□□□□ID□□□□□



```
[root@SN2013-08-020 OMServer]# tree modules/
modules/
├── ansible
│   ├── __init__.py
│   ├── Mid_1001.py
│   ├── Mid_1002.py
│   ├── Mid_1003.py
│   ├── Mid_1004.py
│   ├── Mid_1005.py
│   ├── Mid_1006.py
│   ├── Mid_1007.py
│   └── Public_lib.py
├── func
│   ├── __init__.py
│   ├── Mid_1001.py
│   ├── Mid_1002.py
│   ├── Mid_1003.py
│   ├── Mid_1004.py
│   ├── Mid_1005.py
│   ├── Mid_1006.py
│   ├── Mid_1007.py
│   └── Public_lib.py
└── saltstack
    ├── __init__.py
    ├── Mid_1001.py
    ├── Mid_1002.py
    ├── Mid_1003.py
    ├── Mid_1004.py
    ├── Mid_1005.py
    ├── Mid_1006.py
    ├── Mid_1007.py
    └── Public_lib.py
```

[illegible]13-10 [illegible]

[illegible]config.py[illegible]“AUTO_PLATFORM”[illegible]“ansible”[illegible]“saltstack”[illegible]“func”[illegible]“SECRET_KEY”[illegible]settings.py[illegible]

SECRET_KEY□□□□□□□□□modules/□ansible|saltstack|func□/Public_lib.py□□□□□□□□□□□□□□□API□□□□□□□□□□□□□□□□□□□□□

□/home/test/OMServer/config.py□

```
# -*- coding□ utf-8 -*-

#□/usr/bin/env python

AUTO_PLATFORM = "saltstack"    #□□□□□□□□□Saltstack□Ansible□
Func

#□□□□□□□setting.py□SECRET_KEY□□□□□□

SECRET_KEY = "ctmj#&amp□8hrgow_^sj$ejt@9fzsmh_o□-=
□byt5jmg=e3#foya6u"
```

□□□□□□□□□Modulehandle□□□□□□□□□□□□__init__□□□□□□□□□□□□□□□□□□□□□□□□□□□□ID□□□□□□□□□run□□□□□□□□API□□□□□□□□□□□□□□“□□□□□□”□□□□□□□□□□□□□3□□□□□□□□□□□

1□□□Ansible□□ID□“1007”□□□

□□Ansible□□□□□□□□□□□□□□command□□□□□□□□□□□□□copy□□□□□□□□□□□□□□□□□□

□/home/test/OMServer/modules/ansible/Mid_1007.py□

```
# -*- coding□ utf-8 -*-

from Public_lib import *

#□□□□□□□□□□#

class Modulehandle□□□

    def __init__□self□moduleid□hosts□sys_param_row□□    #□□
□□□□□□□

        self.hosts = ""

        self.Runresult = ""

        self.moduleid = moduleid    #□□ID

        self.sys_param_array= sys_param_row    #□□□□□□□□

        self.hosts=target_host□hosts□"IP"□ #□□□□□□□□□□“IP”□
IP□□□“SN”□□□□

    #□□□□□□□□□

    def run□self□□

        try□     #□□□□□□□□□□□□□□□□□□

            commonname=str□self.sys_param_array[0]□

            if commonname=="resin"□

                self.command="/etc/init.d/resin restart"

            elif commonname=="nginx"□

                self.command="/etc/init.d/nginx restart"

            elif commonname=="haproxy"□

                self.command="/etc/init.d/haproxy restart"

            elif commonname=="apache"□

                self.command="/etc/init.d/httpd restart"
            elif commonname=="mysql"□

                self.command="/etc/init.d/mysql restart"

            elif commonname=="lighttpd"□

                self.command="/etc/init.d/lighttpd restart"

            #□□Ansible□□□API□command□□□□□□□□□□

            self.Runresult = ansible.runner.Runner□

            pattern=self.hosts□ forks=forks□

            module_name="command"□
module_args=self.command□□.run□□

            if len□self.Runresult['dark']□ == 0 and len
□self.Runresult['contacted']□ == 0□

                return "No hosts found□□□□□□□□□□ansible□□□"

        except Exception□e□

            return str□e□

        return self.Runresult    #□□□□□□
```

2□□□Saltstack□□ID□“1007”□□□

□□Saltstack□□□□□□□□□□□□□□cmd□□□□□□“cmd.run”□“cp.get_file”□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/home/test/OMServer/modules/saltstack/Mid_1007.py□

```
    def run□self□□
        try□
            client = salt.client.LocalClient□□
            ……
            #□□Saltstack□□□API□cmd.run□□□□□□□□□□
            self.Runresult  = client.cmd
□self.hosts□'cmd.run'□[self.command]□\

expr_form='list'□
            if len□self.Runresult□ == 0□
                return "No hosts found□□□□□□□□□□saltstack□
□□"
        except Exception□e□
            return str□e□
        return self.Runresult    #□□□□□□
```

3□□□Func□□ID□“1007”□□□

□□Func□□□□□□□□□□□□□□client.command.run□□□□□□□□□□□□□□□client.copyfile.copyfile□□□□□□□□□□□□□□□□□□□□□□□□

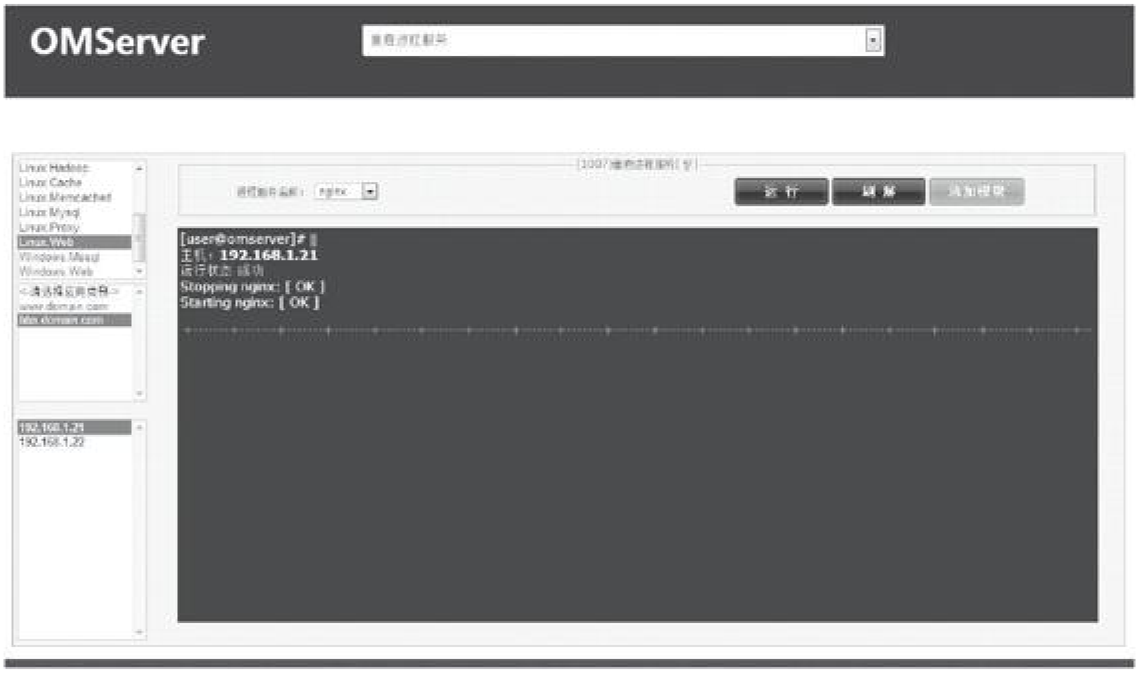
□/home/test/OMServer/modules/func/Mid_1007.py□

```
        def run□self□□
        try□
            client = fc.Overlord□self.hosts□
……
#□□Func□□□API□command.run□□□□□□□□□□
            commonname=str□self.sys_param_array[0]□
            self.Runresult=client.command.run□self.command□
        except Exception□e□
            return str□e□
        return self.Runresult    #□□□□□□
```

□□□□□□□□□□□□□□□□□□□□□□□□□

```
# cd /home/test/OMServer
# python OMservermain.py &
```

□□□□□□□□□□http://omserver.domain.com□□□□□13-11□



```
[user@omserver]# |
主机：192.168.1.21
运行状态 成功
Stopping nginx: [ OK ]
Starting nginx: [ OK ]
```

□13-11 □□□□□□□□

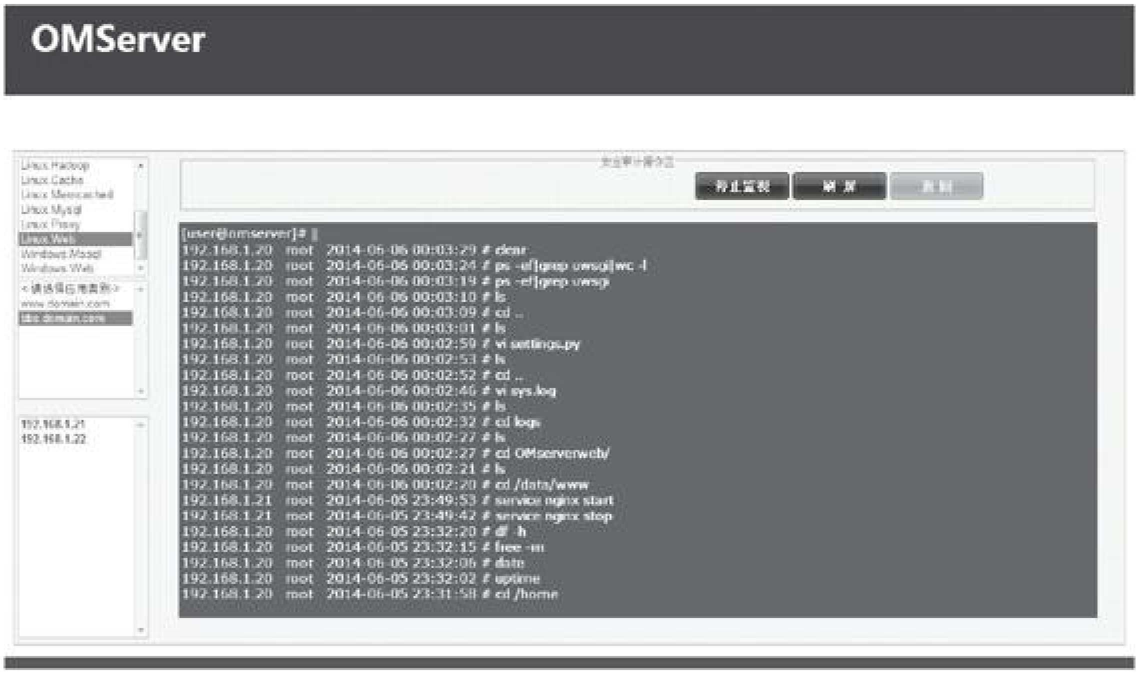
□□□□ RC4□□□□□□□□ http://www.snip2code.com/Snippet/27937/Blockout-encryption-decryption-methods-p□

[illegible]14[illegible] [illegible]Linux[illegible]

[illegible]OMServer[illegible]Linux[illegible]

14.1　□□□□□□

□□□□□□□□OMServer□□□□□□□□□□Linux□□□□□□□□□□□□□□□□□□Linux□□Linux□□□history□□□□□□□□□□□□□□□□□□□□□□□□□□□/etc/profile□history□□□□□□□□□□□□□□□□□□□□□□□□□□□Python□□□□□□□□□□□□□□□□□□□□□□OMServer□□□□□□□□□□□□□□□□□□□□14-1□

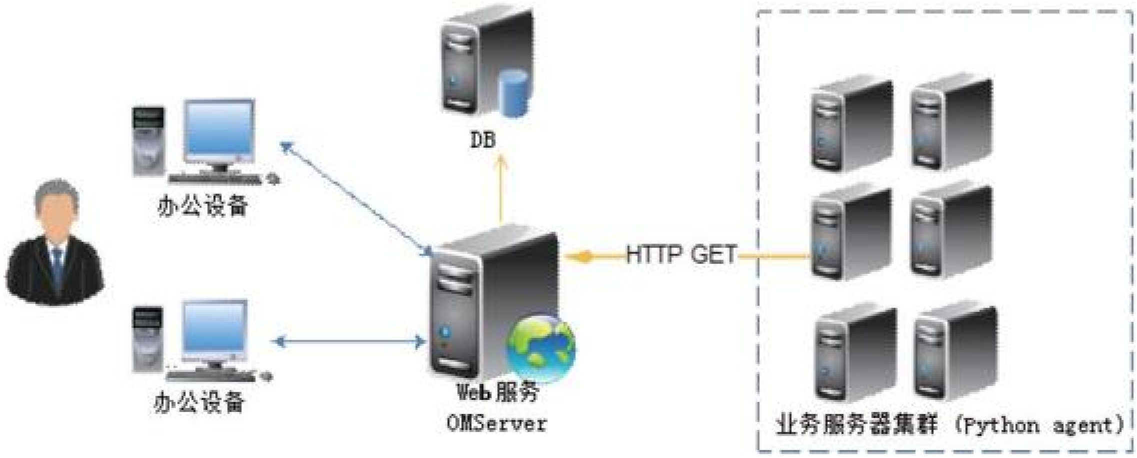


```
[user@omserver]#
192.168.1.20   root   2014-06-06 00:03:29 # clear
192.168.1.20   root   2014-06-06 00:03:24 # ps -ef|grep uwsgi|wc -l
192.168.1.20   root   2014-06-06 00:03:19 # ps -ef|grep uwsgi
192.168.1.20   root   2014-06-06 00:03:10 # ls
192.168.1.20   root   2014-06-06 00:03:09 # cd ..
192.168.1.20   root   2014-06-06 00:03:01 # ls
192.168.1.20   root   2014-06-06 00:02:59 # vi settings.py
192.168.1.20   root   2014-06-06 00:02:53 # ls
192.168.1.20   root   2014-06-06 00:02:52 # cd ..
192.168.1.20   root   2014-06-06 00:02:46 # vi sys.log
192.168.1.20   root   2014-06-06 00:02:35 # ls
192.168.1.20   root   2014-06-06 00:02:32 # cd logs
192.168.1.20   root   2014-06-06 00:02:27 # ls
192.168.1.20   root   2014-06-06 00:02:27 # cd OMserverweb/
192.168.1.20   root   2014-06-06 00:02:21 # ls
192.168.1.20   root   2014-06-06 00:02:20 # cd /data/www
192.168.1.21   root   2014-06-05 23:49:53 # service nginx start
192.168.1.21   root   2014-06-05 23:49:42 # service nginx stop
192.168.1.20   root   2014-06-05 23:32:20 # df -h
192.168.1.20   root   2014-06-05 23:32:15 # free -m
192.168.1.20   root   2014-06-05 23:32:06 # date
192.168.1.20   root   2014-06-05 23:32:02 # uptime
192.168.1.20   root   2014-06-05 23:31:58 # cd /home
```

□14-1　□□□□□□

14.2 □□□□□□

OMServer□□□□□□□□□□□□□B/S□□□□□□□□□□□□□□□Agent□□□□□□□MySQL□□□□□□□□□□□□□□□prototype.js□□□□□□□□□□□□□□□□□□□□14-2□



□14-2 □□□□□

□□14-2□□□□□□□□□□□□□□□□□□□□□□□□□□□□Python□□□□□□□□□OMServer□□□cgi□□□

14.3 □□□□□□□

14.3.1 □□□□□

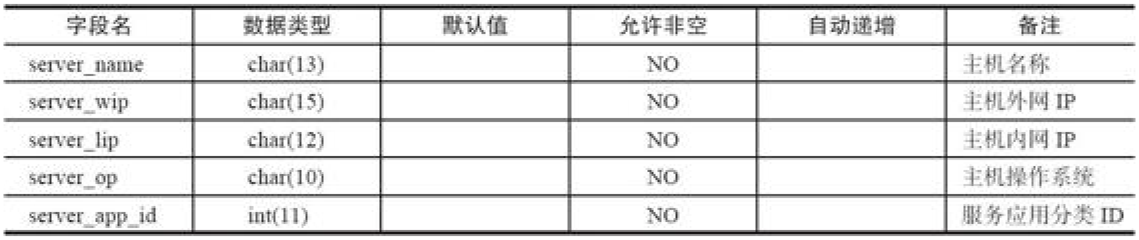
□□□□□□□□□□□□OMServer□□□□□□□□□□□□server_history□□□□□□□□□□□□□□□□server_list□IP□□□□□□□□□□□□□□□□□

·server_history□□□□□□□

·server_list□□□□□□□

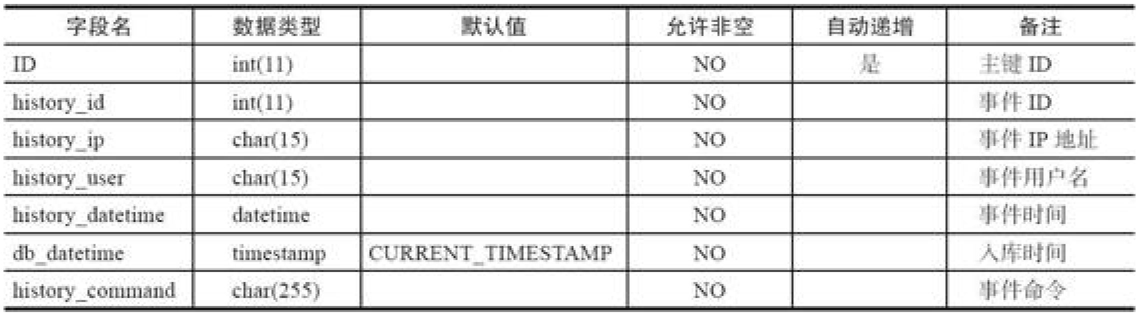
14.3.2 □□□□

server_list□□□□□



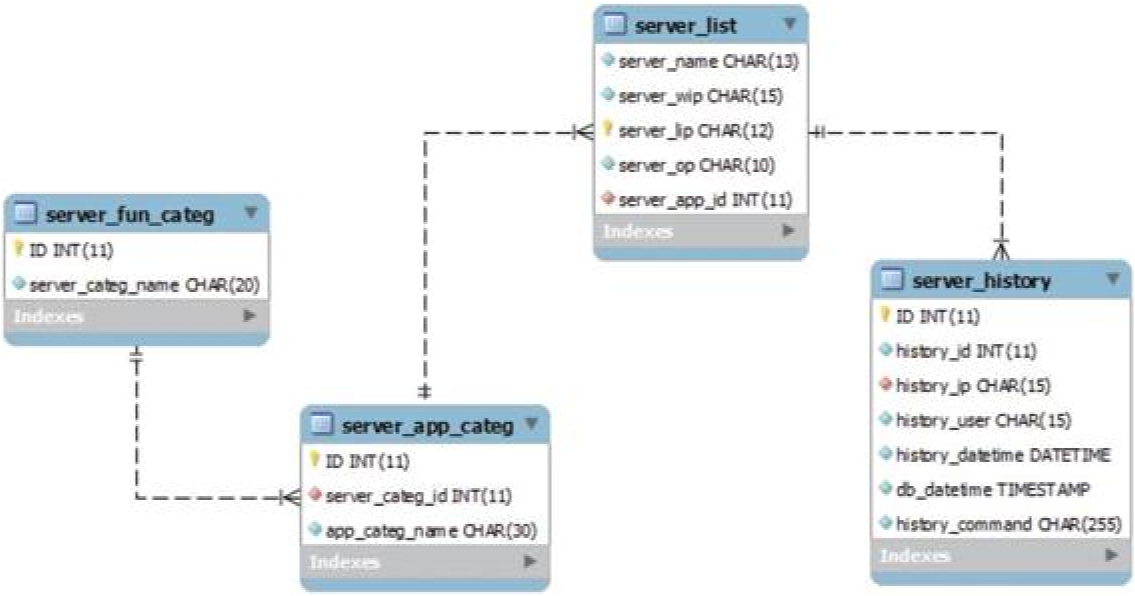
字段名	数据类型	默认值	允许非空	自动递增	备注
server_name	char(13)		NO		主机名称
server_wip	char(15)		NO		主机外网 IP
server_lip	char(12)		NO		主机内网 IP
server_op	char(10)		NO		主机操作系统
server_app_id	int(11)		NO		服务应用分类 ID

server_history□□□□□



字段名	数据类型	默认值	允许非空	自动递增	备注
ID	int(11)		NO	是	主键 ID
history_id	int(11)		NO		事件 ID
history_ip	char(15)		NO		事件 IP 地址
history_user	char(15)		NO		事件用户名
history_datetime	datetime		NO		事件时间
db_datetime	timestamp	CURRENT_TIMESTAMP	NO		入库时间
history_command	char(255)		NO		事件命令

□□□□□□□□□□□OMServer□□□□□□□□server_list□□□□□□□□□□□□□□□□□□□server_history□□□□□□□□server_history□history_ip□□□□□□□□□□server_list□□□server_lip□□□□□□□□□□□□14-3□□□□□□□□



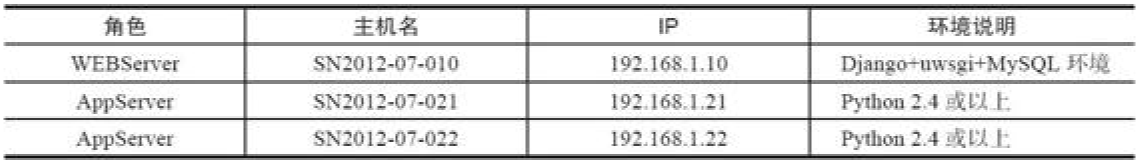
□14-3 □□□□□□□

14.4 □□□□□□

14.4.1 □□□□□□

□□□□□□□□□□□□□□□OMServer□□□App□□□□□□□□□Web Server□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Agent□□□□□Python□□□□□□□□□□□□□□□□□□□14-1□□□

□14-1 □□□□□□□



角色	主机名	IP	环境说明
WEBServer	SN2012-07-010	192.168.1.10	Django+uwsgi+MySQL 环境
AppServer	SN2012-07-021	192.168.1.21	Python 2.4 或以上
AppServer	SN2012-07-022	192.168.1.22	Python 2.4 或以上

14.4.2 □□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□profile□□□□□□□Python□□□□□□□□□□□□

□1□□□□□□□□□

□□□□Linux profile□history□□□□□□□□□□□□□□□□□□□□□□□□□□history□□□□□□□□□□□□□□□□PROMPT_COMMAND□□□□□□□□□□□□□□□□□

```
# vi /etc/profile
# □□□□□□
```

```
#add by OMAudit

export HISTFILE=$HOME/.bash_history    #□□□□history□□□□□□

export HISTSIZE=1200    #□□history □□□□□□□□

export HISTFILESIZE=1200    #□□□□□□□□.bash_history□□□□□□□

export HISTCONTROL=ignoredups    #□□□□□□□□□□

export HISTTIMEFORMAT="`whoami` %F %T "  # history□□□□□□□□□
□□□□□□□□□

# “root 2014-06-05 23□32□16 free –m”

# PROMPT_COMMAND□□□□□□□□□□□□□□□□□bash□□□□□□□□□□

# “history –a” □□□□□□history□□□□histfiles□□“history -c”□□□□
□□□□□□□□□□□

# “history -r” □histfiles □□□□□□□□□□□□□□history□□□

# “/home/test/OMAudit/OMAudit_agent.py $□history 1□” □□$
□history 1□□□□□□□

# □□□□□□□□□□□OMAuditmain.py□□□□□□□□□□□□□□□

export PROMPT_COMMAND="history -a□ history -c□ history -
r□"'/home/test/OMAudit/ OMAudit_agent.py $□history 1□'

shopt -s histappend    #□□□□□□□□□□□□HISTFILE□□□□□□□□□□□□□

typeset -r PROMPT_COMMAND    #□□□□□□□□□□□□□□

typeset -r HISTTIMEFORMAT
```

□□□□□□□□□□□□“source/etc/profile”□□□
profile□□□□□□□

□2□□□□□□□□

□□□□□□□□□□□□□□□□□Linux□□“$□history 1□”□□□□□□□□□□□OMServer□□□□□config.py□□□agent□□□□□□□□□□□□□□□□□□□□

□/home/test/OMAudit/config.py□

```
# -*- coding□ utf-8 -*-

#□/usr/bin/env python

Net_driver = "eth0"    #□□□□□□□□□□□□□□□□□□□□□IP□□

OMServer_address = "omserver.domain.com"    #OMServer□□□□□
□□□□□□□□□

Connect_TimeOut = 3    #□□□□□□□□□□□□□
```

OMAudit_agent.py□□□□□agent□□□□□□□□□□□□□□httplib□□□□HTTP□□□□□□□□□□□□□□

□/home/test/OMAudit/OMAudit_agent.py□

```
#□/usr/bin/env python

#coding□utf-8

import sys

import socket

import fcntl

import struct

import logging
```

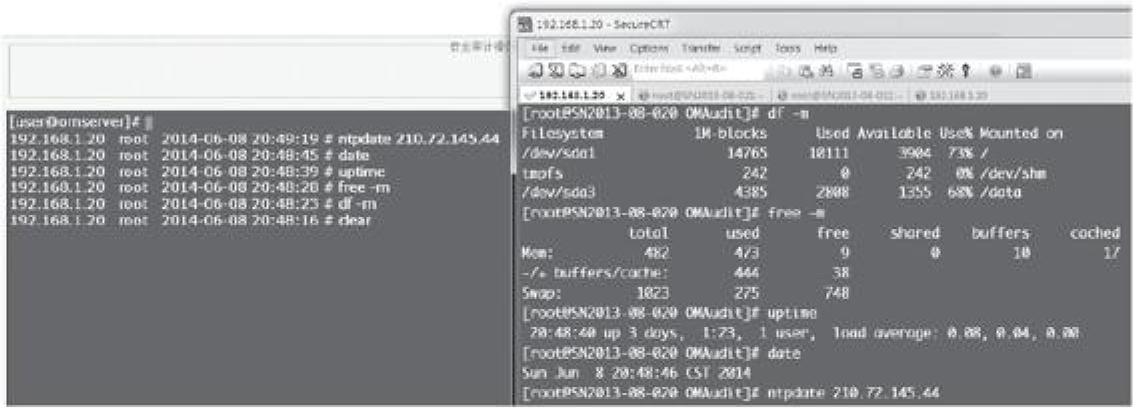
```
from config import *

import urllib，httplib

socket.setdefaulttimeout（Connect_TimeOut）    #Socket
HTTP

logging.basicConfig（level=logging.DEBUG，    #

            format='%（asctime）s [%（levelname）s] %（message）
s'，

            filename=sys.path[0]+'/omsys.log'，

            filemode='a'）

#$history 16“173  root 2014-06-
07 22：05：56 ls”

if len（sys.argv）<6：

    logging.error（'History not configured in
/etc/profile！'）

    sys.exit（）

def get_local_ip（ethname）：    #IP

    try：

        sock = socket.socket（socket.AF_INET，
socket.SOCK_DGRAM）

        addr = fcntl.ioctl（sock.fileno（）， 0x8915，
struct.pack（'256s'， ethname））

        return socket.inet_ntoa（ addr[20：24] ）

    except Exception，e：

        logging.error（'get localhost IP address error：'+str
（e））

        return "127.0.0.1"
```

```
def pull_history□http_get_param=""□□    #□□□□□□

    try□

        #□OMServer□□□□□HTTP□□□□□□□□□

        http_client =httplib.HTTPConnection
□OMServer_address□ 80□ timeout= Connect_TimeOut□

        http_client.request□"GET"□ http_get_param□    #□□
GET□□

        response =http_client.getresponse□□    #□□HTTP□□□□

        if response.status □= 200□    #□HTTP 200□□□□□

            logging.error□'response http status error□'+str
□response.status□□

            sys.exit□□

        http_content=response.read□□.strip□□    #□□□□□
□“OK”□□□

        if http_content □= "OK"□

            logging.error□'response http content
error□'+str□http_content□□

            sys.exit□□

    except Exception□ e□

        logging.error□'connection django-cgi server
error□'+str□e□□

        sys.exit□□

    finally□

        if http_client□

            http_client.close□□

        else□
```

```
            logging.error□'connection django-cgi server
unknown error.'□

            sys.exit□□

Sysip = get_local_ip□Net_driver□     #□□□□□□IP□□

SysUser = sys.argv[2]                #□□history□□□□□□□□

History_Id = sys.argv[1]             #□□history ID□□

History_date = sys.argv[3]           #□□history □□□□

History_time = sys.argv[4]           #□□history □□□□

History_command = ""

for i in range□5□ len□sys.argv□□□    #□□history□□□□□□□

    History_command+= sys.argv[i]+" "

#□□□□□□□HTTP GET□□□□□□□□□□□urllib.quote□□URL□□

s= "/omaudit/omaudit_pull/□
history_id="+History_Id+"&history_ip="+Sysip+"&history_user
="+SysUser+ \

"&history_datetime="+History_date+urllib.quote□" "□
+History_time+"&history_com

mand="+urllib.quote□History_command.strip□□□

pull_history□s□    #□□□□□□□□
```

□
□“/home/test/OMAudit/OMAudit_agent.py”□□□□□□□□□□chmod□□□□□□□□agent□□□□□□□□□□SSH□□□□Linux□□□□□□□□□shell□□□□□□□□□□□□□□□□14-4□

```
# chmod +x/home/test/OMAudit/OMAudit_agent.py
```



```
[user@omserver]#
192.168.1.20  root  2014-06-08 20:49:19 # ntpdate 210.72.145.44
192.168.1.20  root  2014-06-08 20:48:45 # date
192.168.1.20  root  2014-06-08 20:48:39 # uptime
192.168.1.20  root  2014-06-08 20:48:28 # free -m
192.168.1.20  root  2014-06-08 20:48:23 # df -m
192.168.1.20  root  2014-06-08 20:48:16 # clear
```

```
[root@SN2013-08-020 OMAudit]# df -m
Filesystem           1M-blocks      Used Available Use% Mounted on
/dev/sda1                14765     10111      3904  73% /
tmpfs                      242         0       242   0% /dev/shm
/dev/sda3                 4385      2808      1355  68% /data
[root@SN2013-08-020 OMAudit]# free -m
             total       used       free     shared    buffers     cached
Mem:           482        473          9          0         10         17
-/+ buffers/cache:        444         38
Swap:         1023        275        748
[root@SN2013-08-020 OMAudit]# uptime
 20:48:40 up 3 days,  1:23,  1 user,  load average: 0.08, 0.04, 0.00
[root@SN2013-08-020 OMAudit]# date
Sun Jun  8 20:48:46 CST 2014
[root@SN2013-08-020 OMAudit]# ntpdate 210.72.145.44
```

[illegible]14-4 [illegible]

14.5 □□□□□□□□

14.5.1 Django□□

□□□□□□□□OMServer□□□□□□□□□□Web□□□□□□□□□Django□□□□□□□□□□□□□□□□□□□□□□□□□□□□App□□□□□□□□□□□□□App□□□□□□

```
# cd /data/www/OMserverweb

# python manage.py startapp omaudit
```

□□□□omaudit□□□□□urls.py□□□App□URL□□□□□□□□□□

```
from django.conf.urls.defaults import *

urlpatterns = patterns□'omaudit.views'□

    □r'^$'□'index'□□

    □r'omaudit_pull/$'□'omaudit_pull'□□   #□□□omaudit_pull□
□□□□□□□□□□□

    □r'omaudit_run/$'□'omaudit_run'□□    #□□□omaudit_run□□□
□□□□□□□□

□
```

□□App□models.py□□□□□□□□□□□□□□□□□□

```
from django.db import models

# Create your models here.

class ServerHistory□models.Model□□

    id = models.IntegerField□primary_key=True□
db_column='ID'□ # Field name made lowercase.

    history_id = models.IntegerField□□

    history_ip = models.CharField□max_length=45□

    history_user = models.CharField□max_length=45□

    history_datetime = models.DateTimeField□□

    db_datetime = models.DateTimeField□□

    history_command = models.CharField□max_length=765□

    class Meta□

        db_table = u'server_history'
```

□□□□□□□□□□□□□□□□python manage.py inspectdb□□□□□models□□□

□□□□□□settings.py□□□□App□□□□□□□□

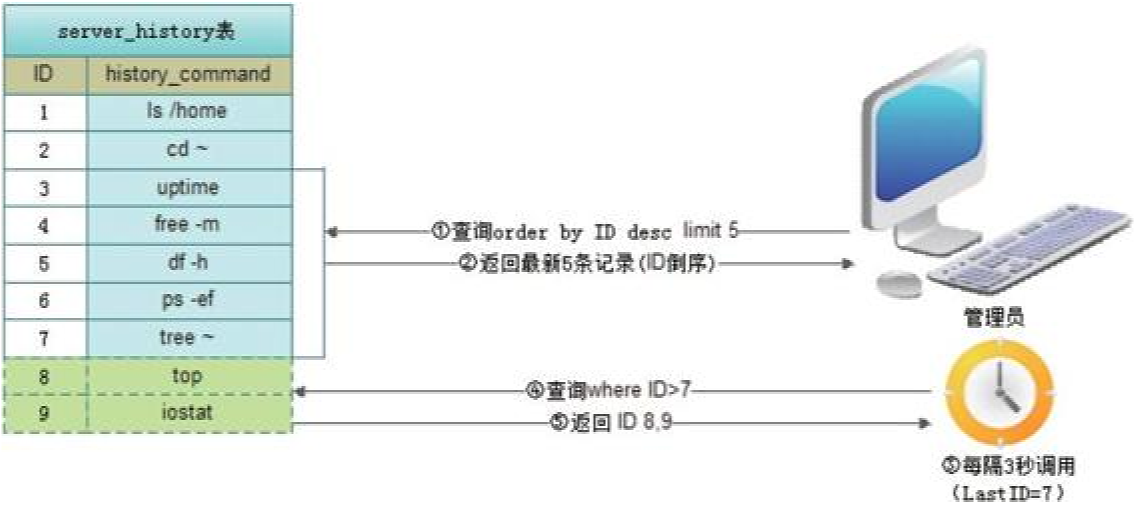
```
INSTALLED_APPS = □

… …

    # 'django.contrib.admindocs'□

    'public'□

    'autoadmin'□
    'omaudit'□    #□□□□□□□□App
□
```

14.5.2 □□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□omaudit_run□□□□□□□omaudit_pull□□□□□□□□□□□□□□□

□1□□□□□□□□omaudit_run□□□

□□□□□□□□□□□□□□□□□□□□JavaScript□setInterval□□□□□□□□□□□□□□□□□□□□□ID□□□□5□□□□□□□□LastID□□□□□ID□□□□□□□□□□□□LastID□□□□□□□□□□□“ID>LastID”□□14-5□



□14-5 □□□□□□□□□

omaudit_run□□□□□□□□□□□

```
"""
=□□□□□□□□□□
"""
def omaudit_run□request□□
    if not 'LastID' in request.GET□    #□□□□□□□□□□□□ID
        LastID=""
    else□
        LastID=request.GET['LastID']
    if not 'hosts' in request.GET□    #□□□□□□□□□□□
        Hosts=""
    else□
        Hosts=request.GET['hosts']
    ServerHistory_string=""
    host_array=target_host□Hosts□"IP"□.split□'□'□    #□□
target_host□□□□□IP□□
    if LastID=="0"□      #□□□□□□□□□□□□□□“id>LastID”□□□□□
        if Hosts==""□    #□□□□□□□□□□□□□□□“history_ip in
host_array”
                         #□□□□□
            ServerHistoryObj = ServerHistory.objects \
            .order_by□'-id'□[□5]
        else□
```

```
            ServerHistoryObj = ServerHistory.objects \

            .filter□history_ip__in=host_array□.order_by□'-
id'□[□5]

    else□

        if Hosts==""□

            ServerHistoryObj = ServerHistory.objects \

            .filter□id__gt=LastID□.order_by□'-id'□

        else□

            ServerHistoryObj = ServerHistory.objects \

            .filter□id__gt=LastID□
history_ip__in=host_array□.order_by□'-id'□

    lastid=""

    i=0

    for e in ServerHistoryObj□    #□□□□□□□□□□□□

        if i==0□

            lastid=e.id

        ServerHistory_string+="<font
color=#cccccc>"+e.history_ip+ \

        "</font>&nbsp□&nbsp□\t"+ e.history_user+"&nbsp□
&nbsp□\t"+ \

        str□e.db_datetime□+"\t # <font
color=#ffffff>"+e.history_command+"</font>*"

        i+=1

    ServerHistory_string+="@@"+str□lastid□    #□□“@@”□□□□□□
□□□lastid□
```

```
                                              #□□□□
    return HttpResponse□ServerHistory_string□
```

□2□□□□□□omaudit_pull□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

```
"""
=□□□□pull□□
"""
def omaudit_pull□request□□
    if request.method == 'GET'□    #□□HTTP□GET□□□□□□□□
        if not request.GET.get□'history_id'□ ''□□
            return HttpResponse□"history_id null"□
        if not request.GET.get□'history_ip'□ ''□□
            return HttpResponse□"history_ip null"□
        if not request.GET.get□'history_user'□ ''□□
            return HttpResponse□"history_user null"□
        if not request.GET.get□'history_datetime'□ ''□□
            return HttpResponse□"history_datetime null"□
        if not request.GET.get□'history_command'□ ''□□
            return HttpResponse□"history_command null"□
        history_id=request.GET['history_id']    #□□HTTP□□□□
□
```

```
        history_ip=request.GET['history_ip']

        history_user=request.GET['history_user']

        history_datetime=request.GET['history_datetime']

        history_command=request.GET['history_command']

        historyobj = ServerHistory□history_id=history_id□
\    #□□□□□insert□

            history_ip=history_ip□ \

            history_user=history_user□ \

            history_datetime=history_datetime□ \

            history_command=history_command□

        try□

            historyobj.save□□

        except Exception□e□

            return HttpResponse□"□□□□□□□□□□□□□"+str□e□□

        Response_result="OK"    #□□“OK”□□□□□□□□

        return HttpResponse□Response_result□

    else□

        return HttpResponse□"□□□□□"□
```

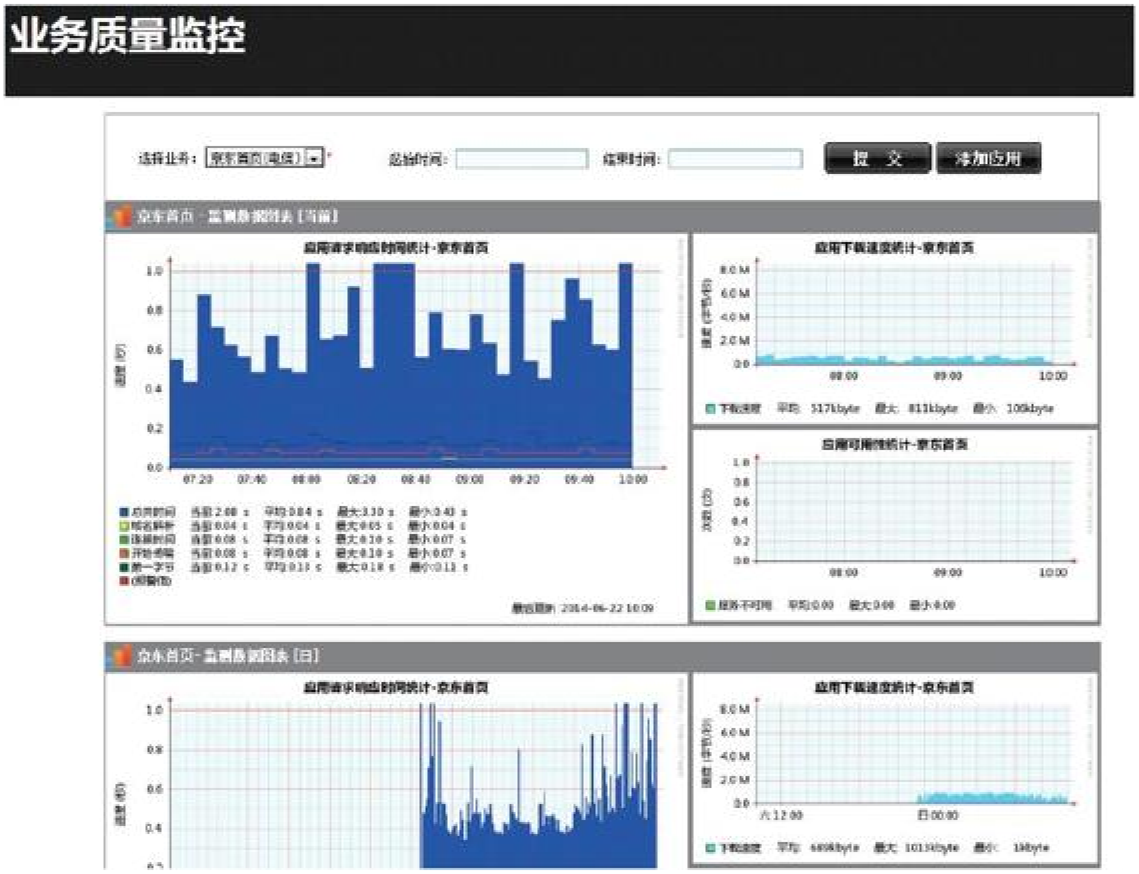
□□Linux□□□

[illegible]15[illegible] [illegible]

[illegible]IDC[illegible]BGP[illegible]IDC[illegible]

15.1 [illegible]

[illegible]Web[illegible]DNS[illegible]HTTP[illegible]HTTP[illegible]RRDTOOL[illegible]15-1[illegible]

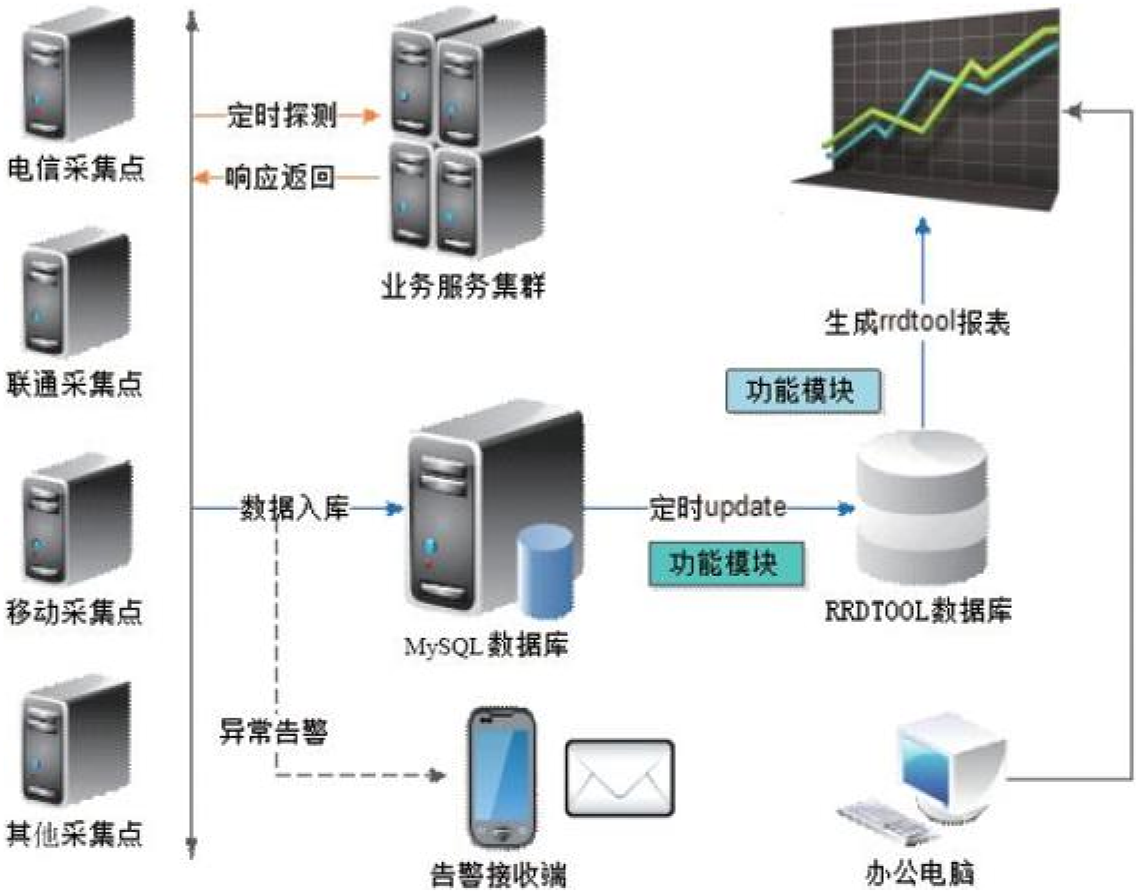


[illegible]15-1 [illegible]

15.2 [illegible]

[illegible]Python+pycurl[illegible]MySQL[illegible]rrdtool[illegible]MySQL[illegible]RRDTOOL[illegible]Python+rrdtool[illegible]Web[illegible]Django+MySQL+rrdtool[illegible]Nginx+uwsgi[illegible]Web[illegible]15-2[illegible]

[illegible]15-2[illegible]MySQL[illegible]MySQL[illegible]rrdtool update[illegible]Web[illegible]


电信采集点
联通采集点
移动采集点
其他采集点
定时探测
响应返回
业务服务集群
数据入库
MySQL 数据库
异常告警
告警接收端
定时update
功能模块
RRDTOOL数据库
功能模块
生成rrdtool报表
办公电脑

□15-2 □□□□

15.3 □□□□□□□

15.3.1 □□□□□

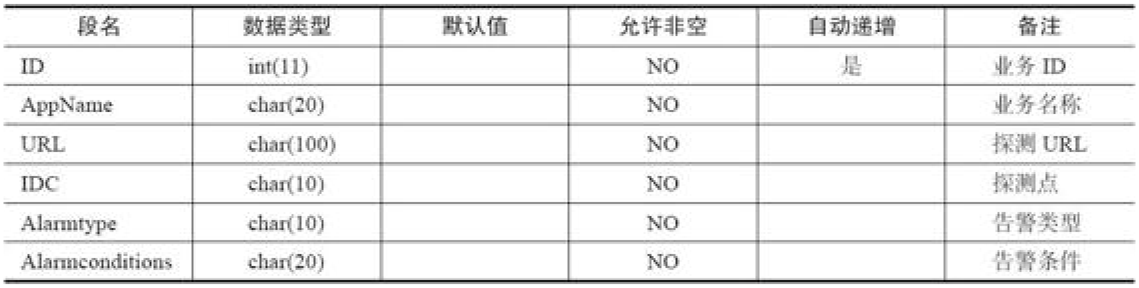
□□□□□□□□□□□□□□□□□□□□
webmonitor_hostinfo□
webmonitor_monitordata□□□□
webmonitor_monitordata□FID□□□□□□□□□□□
□□□□□□

·webmonitor_hostinfo□□□□□□

·webmonitor_monitordata□□□□□□□□

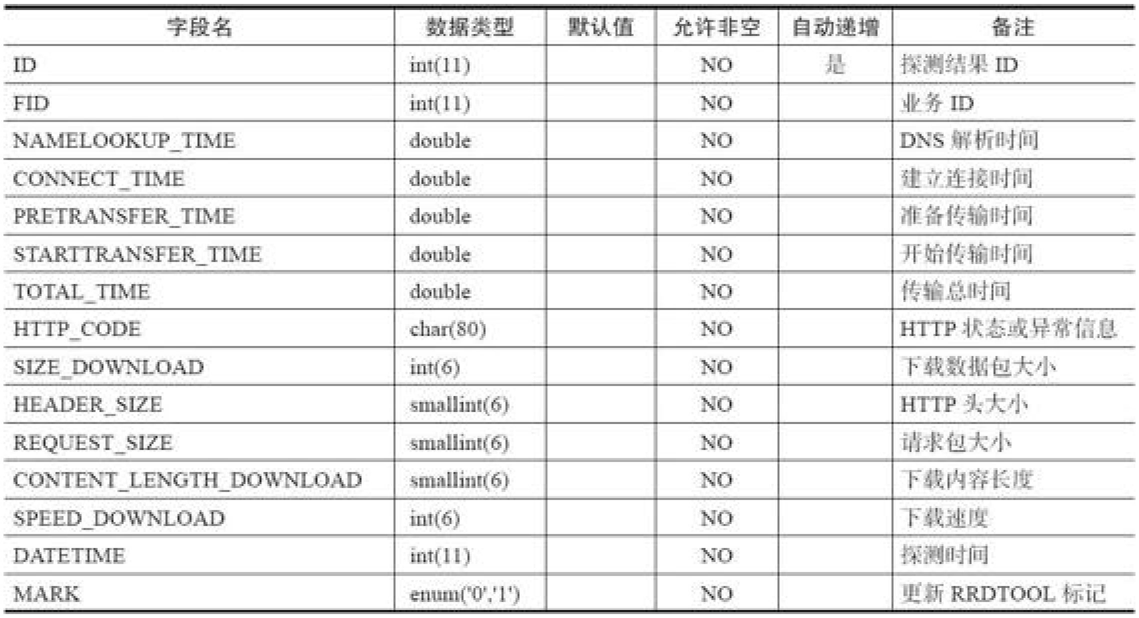
15.3.2 □□□□

webmonitor_hostinfo□□□□□□



段名	数据类型	默认值	允许非空	自动递增	备注
ID	int(11)		NO	是	业务 ID
AppName	char(20)		NO		业务名称
URL	char(100)		NO		探测 URL
IDC	char(10)		NO		探测点
Alarmtype	char(10)		NO		告警类型
Alarmconditions	char(20)		NO		告警条件

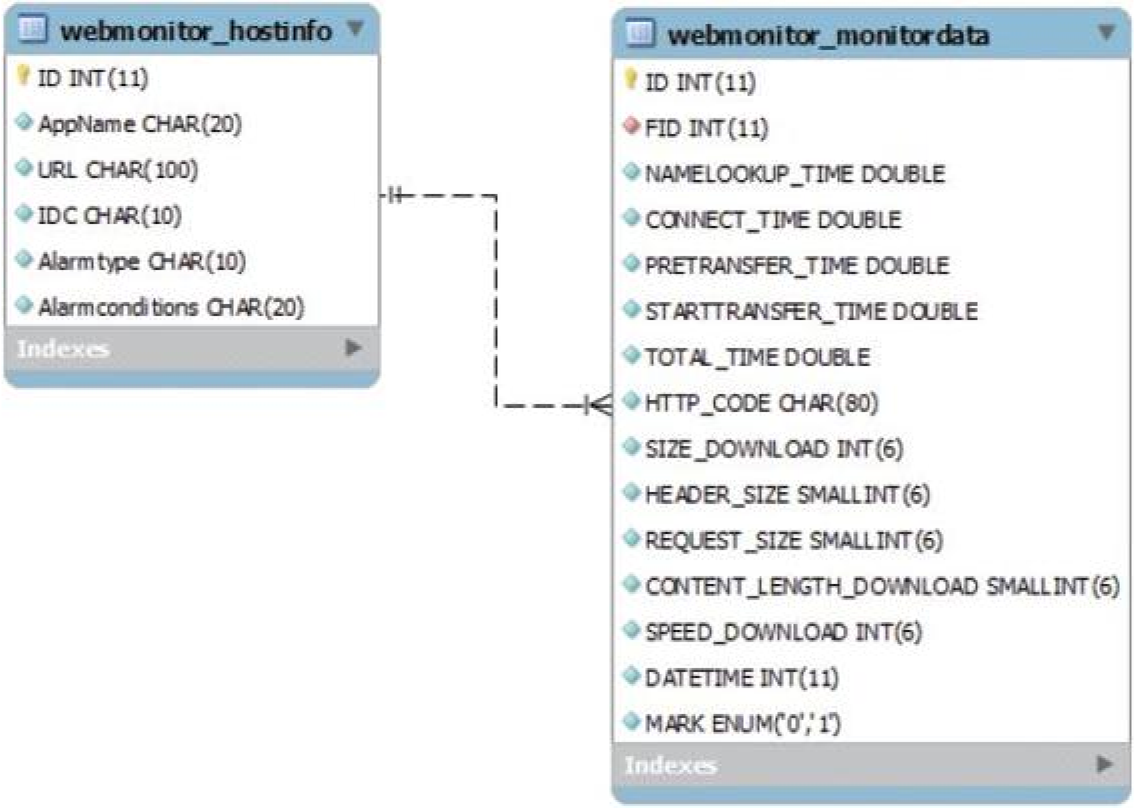
webmonitor_monitordata□□□□□□□□



字段名	数据类型	默认值	允许非空	自动递增	备注
ID	int(11)		NO	是	探测结果 ID
FID	int(11)		NO		业务 ID
NAMELOOKUP_TIME	double		NO		DNS 解析时间
CONNECT_TIME	double		NO		建立连接时间
PRETRANSFER_TIME	double		NO		准备传输时间
STARTTRANSFER_TIME	double		NO		开始传输时间
TOTAL_TIME	double		NO		传输总时间
HTTP_CODE	char(80)		NO		HTTP 状态或异常信息
SIZE_DOWNLOAD	int(6)		NO		下载数据包大小
HEADER_SIZE	smallint(6)		NO		HTTP 头大小
REQUEST_SIZE	smallint(6)		NO		请求包大小
CONTENT_LENGTH_DOWNLOAD	smallint(6)		NO		下载内容长度
SPEED_DOWNLOAD	int(6)		NO		下载速度
DATETIME	int(11)		NO		探测时间
MARK	enum('0','1')		NO		更新 RRDTOOL 标记

15.3.3 [illegible]

[illegible]15-3[illegible]EER[illegible] webmonitor_monitordata[illegible]FID[illegible] webmonitor_hostinfo[illegible]ID[illegible]



webmonitor_hostinfo

- ID INT(11)
- AppName CHAR(20)
- URL CHAR(100)
- IDC CHAR(10)
- Alarmtype CHAR(10)
- Alarmconditions CHAR(20)

Indexes

webmonitor_monitordata

- ID INT(11)
- FID INT(11)
- NAMELOOKUP_TIME DOUBLE
- CONNECT_TIME DOUBLE
- PRETRANSFER_TIME DOUBLE
- STARTTRANSFER_TIME DOUBLE
- TOTAL_TIME DOUBLE
- HTTP_CODE CHAR(80)
- SIZE_DOWNLOAD INT(6)
- HEADER_SIZE SMALLINT(6)
- REQUEST_SIZE SMALLINT(6)
- CONTENT_LENGTH_DOWNLOAD SMALLINT(6)
- SPEED_DOWNLOAD INT(6)
- DATETIME INT(11)
- MARK ENUM('0','1')

Indexes

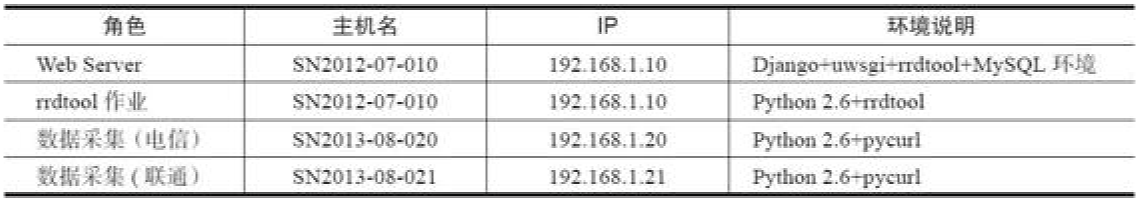
□15-3 □□□□□□□

15.4 □□□□□□

15.4.1 □□□□□□

□□15-1□□□

□15-1 □□□□□□□



角色	主机名	IP	环境说明
Web Server	SN2012-07-010	192.168.1.10	Django+uwsgi+rrdtool+MySQL 环境
rrdtool 作业	SN2012-07-010	192.168.1.10	Python 2.6+rrdtool
数据采集（电信）	SN2013-08-020	192.168.1.20	Python 2.6+pycurl
数据采集（联通）	SN2013-08-021	192.168.1.21	Python 2.6+pycurl

15.4.2 □□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□HTTP□□□□□□□□□□□□□MySQL□□□□□□□□□□HTTP□□□□□□□□□□□□192.168.1.20□192.168.1.21□□□□□□□□□□□□□□□□□□□□□□

□□□□□□□□□Python□□□□□□config.py□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□/data/detector/config.py□

```
# -*- coding□ utf-8 -*-

#□□MySQL□□□□

DBNAME='WebMonitor'
```

```
DBUSER='webmonitor_user'

DBPASSWORD='SKJDH3745tgDTS'

DBHOST='192.168.1.10'

# [illegible]

# settings.py [illegible]IDC={'ct'[illegible]'[illegible]'[illegible]'cnc'[illegible]'[illegible]'[illegible]'cmcc'[illegible]'[illegible]'}

# “ct”[illegible]“cnc”[illegible]“cmcc”[illegible]

IDC="ct"

#[illegible]

CONNECTTIMEOUT = 5

#[illegible]

TIMEOUT = 10

#[illegible]

MAILTO="user1@domain.com[illegible]user2@domain.com"

#[illegible]

MOBILETO="136****3463"
```

[illegible]runmonitor.py[illegible]pycurl[illegible]setopt[illegible]HTTP[illegible]request[illegible]getinfo[illegible]HTTP[illegible]response[illegible]

[illegible]/data/detector/runmonitor.py[illegible]

……

```
Curlobj = pycurl.Curl□□    #□□Curl□□

Curlobj.setopt□Curlobj.URL□ url□    #□□□□□URL

#□□setopt□□□□□□□□□□□□□□2.4□

Curlobj.setopt□Curlobj.CONNECTTIMEOUT□ CONNECTTIMEOUT□

Curlobj.setopt□Curlobj.TIMEOUT□ TIMEOUT□

Curlobj.setopt□Curlobj.NOPROGRESS□ 0□

Curlobj.setopt□Curlobj.FOLLOWLOCATION□ 1□

Curlobj.setopt□Curlobj.MAXREDIRS□ 5□

Curlobj.setopt□Curlobj.OPT_FILETIME□ 1□

Curlobj.setopt□Curlobj.NOPROGRESS□ 1□

bodyfile = open□os.path.dirname□os.path.realpath□__file__□□
+"/_body"□ "wb"□

Curlobj.setopt□Curlobj.WRITEDATA□ bodyfile□

Curlobj.perform□□

bodyfile.close□□

#□□getinfo□□□□□□□□□□□□□□□□2.4□

self.NAMELOOKUP_TIME=Decimal□str□round□Curlobj.getinfo
□Curlobj.NAMELOOKUP_TIME□□ 2□□□

self.CONNECT_TIME=Decimal□str□round□Curlobj.getinfo
□Curlobj.CONNECT_TIME□□2□□□

self.PRETRANSFER_TIME=Decimal□str□round□Curlobj.getinfo
□Curlobj.PRETRANSFER_TIME□□2□□□

self.STARTTRANSFER_TIME=Decimal□str□round□Curlobj.getinfo
□Curlobj.STARTTRANSFER_TIME□□2□□□
```

```
self.TOTAL_TIME = Decimal□str□round□Curlobj.getinfo
□Curlobj.TOTAL_TIME□□2□□□

self.HTTP_CODE =  Curlobj.getinfo□Curlobj.HTTP_CODE□

……
```

□□□□□□crontab□5□□□□□□□□□□□□□

```
*/5 * * * * /usr/bin/python /data/detector/runmonitor.py >
/dev/null 2>&1
```

15.4.3 rrdtool□□

rrdtool□□□□□MySQL□□□□□□□□rrdtool□□□□□□□□rrdtool□□□□□□□□□□□□□□□□□□□□webmonitor_monitordata□□□MARK□'0'□□□□□□□□□□rrdtool.updatev□□□□□rrdtool□□□□□□□□□□□□MARK□'1'□rrdtool□□□□□□□□□□rrdtool□□□□□□□□□□□□□rrdtool□□□Web Server□□□□□□□□□□□□□□□□□□□

□/data/www/Servermonitor/webmonitor/updaterrd.py□

```
    def updateRRD□self□rowobj□□        #□□rrd□□□□

        if str□rowobj["HTTP_CODE"]□=="200"□    #□HTTP200□□□
□“1”

            unavailablevalue=0
        else□

            unavailablevalue=1

        FID=rowobj["FID"]

        time_rrdpath=RRDPATH+'/'+str□self.getURL□FID□□
+'/'+str□FID□+'_'+\

        str□self.rrdfiletype[0]□+'.rrd'    #□□□□□□□□rrdtool
□□□□

        download_rrdpath=RRDPATH+'/'+str□self.getURL□FID□□
+'/'+str□FID□+'_'+\

        str□self.rrdfiletype[1]□+'.rrd'

        unavailable_rrdpath=RRDPATH+'/'+str□self.getURL
□FID□□+'/'+str□FID□+'_'+\

        str□self.rrdfiletype[2]□+'.rrd'

        try□    #□□□□MySQL□□□□□rrd□□

            rrdtool.updatev□time_rrdpath□'%s□%s□%s□%s□%s□
%s' %□str□rowobj["DATETIME"]□\

□str□rowobj["NAMELOOKUP_TIME"]□□str
□rowobj["CONNECT_TIME"]□□str□rowobj["PRETRANSFER_TIME"]□□
str□rowobj["STARTTRANSFER_TIME"]□□str
□rowobj["TOTAL_TIME"]□□□

            rrdtool.updatev□download_rrdpath□'%s□%s' %□str
□rowobj ["DATETIME"]□□\

            str□rowobj["SPEED_DOWNLOAD"]□□□

            rrdtool.updatev□unavailable_rrdpath□'%s□%s' %
□str□rowobj

            ["DATETIME"]□\

            □str□unavailablevalue□□□

            self.setMARK□rowobj["ID"]□    #□□□□□□□
        except Exception□e□
            logging.error□'Update rrd error□'+str□e□□
    def setMARK□self□_id□□     #□□□□□□□□□
        try□
            self.cursor.execute□"update
webmonitor_monitordata set \
            MARK='1' where ID='%s'"%□_id□□
            self.conn.commit□□
        except Exception□e□
            logging.error□'SetMark datebase  error□'+str
□e□□
    def getNewdata□self□□       #□□□□□□□□□□□□
        try□
            self.cursor.execute□"select ID□FID□
NAMELOOKUP_TIME□CONNECT_
TIME□PRETRANSFER_TIME□STARTTRANSFER_TIME□TOTAL_TIME□
HTTP_CODE□SPEED_DOWNLOAD□DATETIME from
webmonitor_monitordata where MARK='0'"□
            for row in self.cursor.fetchall□□□
                self.updateRRD□row□
        except Exception□e□
            logging.error□'Get new database  error□'+str
□e□□
```

[illegible]config.py[illegible]rrdtool[illegible]crontab[illegible]5[illegible]

```
*/5 * * * * /usr/bin/python /data/www/Servermonitor/webmonitor/updaterrd.py > /dev/null 2>&1
```

15.5 □□□□□□□□

□□□□□Web□□□□□□□□□□□Django□□□□□□□□□rrdtool□□□□□□□□□□rrdtool create□□□□□□□rrdtool graph□□□□□□□□□□□□□□□□SQL□□□□□Django□ORM□□□□SQL□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

15.5.1 Django□□

□□□□□Django□□□□□□□□□□□□□□□□□□□□

```
# cd /data/www

# django-admin.py startproject Servermonitor
```

□□□□omaudit□□□□□urls.py□□□App□URL□□□□□□□□□□

```
from django.conf.urls.defaults import *

urlpatterns = patterns□'webmonitor.views'□

    □r'^$'□'index'□□    #□□□index□□□□□□□□□□□

    □r'add_do/'□'adddo'□□    #□□□adddo□□□□□□□□□□□□□□□□□

    □r'add/'□'add'□□    #□□□add□□□□□□□□□□□□□

    □r'monitorlist/'□'monitorlist'□□    #□□□monitorlist□□□□
□□□□□□□□□□□
```

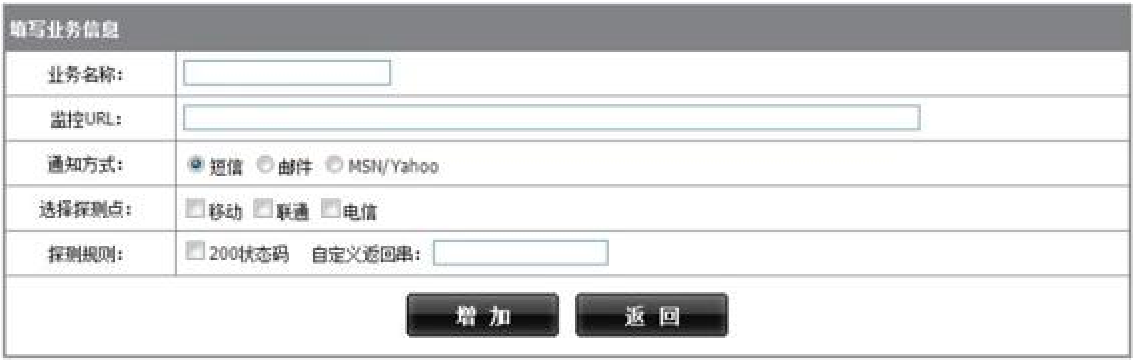
settings.py

```
import os

BASE_DIR = os.path.dirnameos.path.abspath__file__

SYSTEM_NAME=" V1.0"    #

IDC={'ct''''cnc''''cmcc'''}    #IDC

RRDPATH=BASE_DIR+"/rrd"    #rrdtool rrd

PNGPATH=BASE_DIR+"/site_media/rrdtool"    #rrdtool png


#webmonitor appgraphrrd.shrrd

MAINAPPPATH=BASE_DIR+"/webmonitor"

#

TIME_ALARM=1    #“”HRULE

TIME_YMAX=1     #“”Y

DOWN_APEED_YMAX=8388608    #“”Y
```

Appwebmonitorpublicclass App

15.5.2

□□□□□□□□□□□□□□□□□□□□MySQL□□□□□□□□□□URL□□□□□□□□□□□□□□□□□□□□□□□□□□rrdtool□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□15-4□□



填写业务信息

业务名称:	
监控URL:	
通知方式:	● 短信 ○ 邮件 ○ MSN/Yahoo
选择探测点:	☐ 移动 ☐ 联通 ☐ 电信
探测规则:	☐ 200状态码 自定义返回串:

□15-4 □□□□□

□□rrd□□□□□rrdtool□□□create□□□□□□□□□□□□

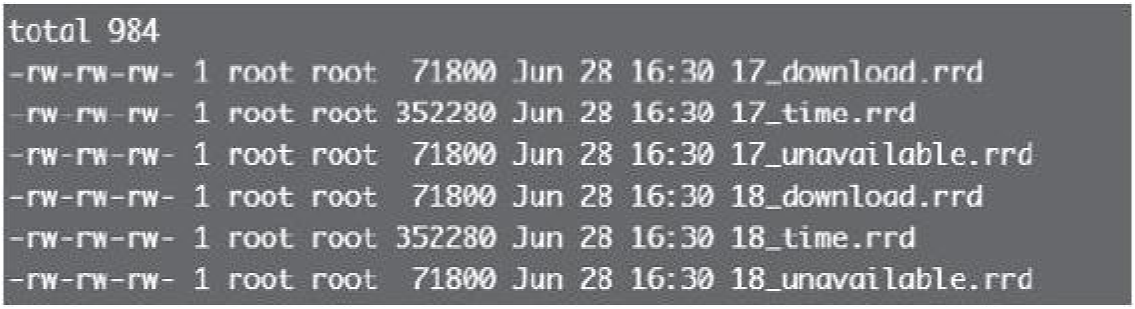
```
"""
=□□rrd
-create_rrd□url□
"""
def create_rrd□url□□
    URL=url
    domain=GetURLdomain□url□    #□□GetURLdomain□□□□□URL□□□
□
    HID=[]
    cur_time=str□int□time.time□□□□  #□□□□Linux□□□□□□
```

```
rrdool.create□□□start□□□

    HID=getID□URL□    #□□getID□□□□□□URL□□□□□□□□ID

    for id in  HID□    #□□□□□ID

        try□

            #□□□□rrd□□□□□□“□□□□
□/rrd/www.baidu.com/17_time.rrd”□

            # step□□□□□□□□300□□□□□5□□□□□□□□start□□□□□□□□□

             #□□□□□□cur_time□□□□

            rrd_time=rrdtool.create
□settings.RRDPATH+'/'+str□domain□+'/'+str□id□+ \

                    '_time.rrd'□'--step'□'300'□'--start'□
cur_time□

                    'DS□NAMELOOKUP_TIME□GAUGE□600□0□U'□
#□□□□5□□□□□DS□

                    'DS□CONNECT_TIME□GAUGE□600□0□U'□
#GAUGE□□□□□□□□□□

                                                        #□□
□□RRD□

                    'DS□PRETRANSFER_TIME□GAUGE□600□0□U'□
#‘600’□□□□□□□


#□□□□□□□□□

                    'DS□STARTTRANSFER_TIME□GAUGE□600□0□
U'□    #UNKNOWN□□□0□U


   #□□□□□□□

                    'DS□TOTAL_TIME□GAUGE□600□0□U'□

                    'RRA□AVERAGE□0.5□1□600'□    #□□□□□□□□
```

```
□RRA□□□□□□□□

                                                                  #□□□□□□□□□

                                 'RRA□AVERAGE□0.5□6□700'□         #□□□□□□□□□□
□□3.2□□□

                                                                  #□□□□

                                 'RRA□AVERAGE□0.5□24□775'□

                                 'RRA□AVERAGE□0.5□288□797'□

                                 'RRA□MAX□0.5□1□600'□

                                 'RRA□MAX□0.5□6□700'□

                                 'RRA□MAX□0.5□24□775'□

                                 'RRA□MAX□0.5□444□797'□

                                 'RRA□MIN□0.5□1□600'□

                                 'RRA□MIN□0.5□6□700'□

                                 'RRA□MIN□0.5□24□775'□

                                 'RRA□MIN□0.5□444□797'□

                        if rrd_time□

                            logging.error□rrdtool.error□□□

                         □□□□□□□rrdtool.create□□□□□□□□□□

                    except Exception□e□

                        logging.error□'create rrd error□'+str□e□□
```

□□“www.baidu.com”□□□□□□□□□□“#ll rrd/www.baidu.com”□□□□□□□rrd□□□□□□□

15-5□□□“17_□18_”□□□□□□□□□□ID□□

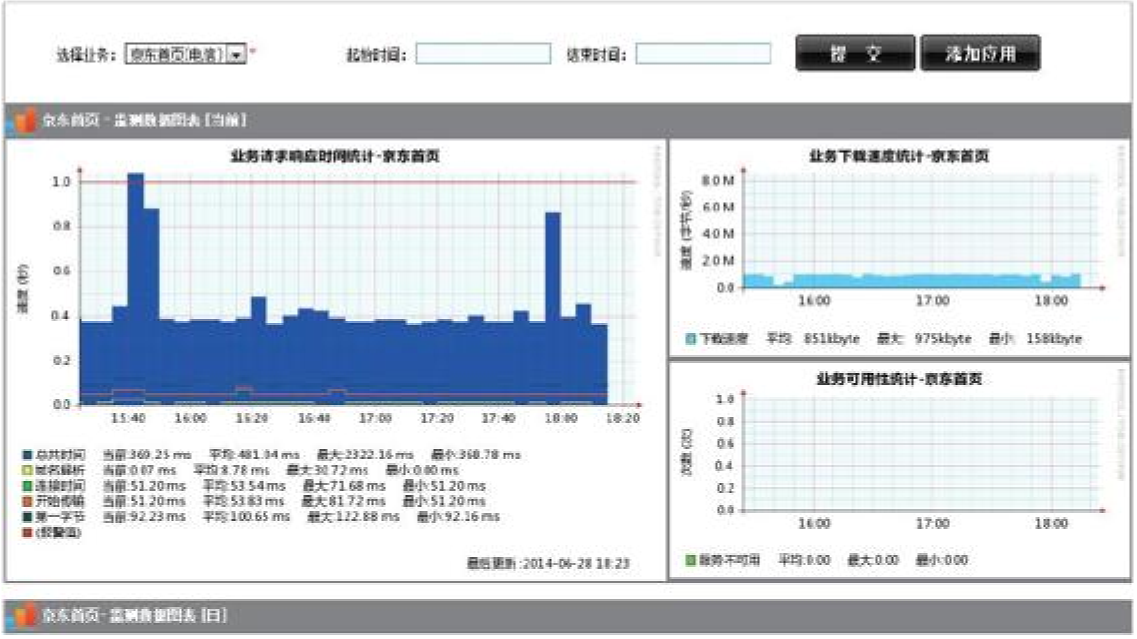


```
total 984
-rw-rw-rw- 1 root root  71800 Jun 28 16:30 17_download.rrd
-rw-rw-rw- 1 root root 352280 Jun 28 16:30 17_time.rrd
-rw-rw-rw- 1 root root  71800 Jun 28 16:30 17_unavailable.rrd
-rw-rw-rw- 1 root root  71800 Jun 28 16:30 18_download.rrd
-rw-rw-rw- 1 root root 352280 Jun 28 16:30 18_time.rrd
-rw-rw-rw- 1 root root  71800 Jun 28 16:30 18_unavailable.rrd
```

□15-5　□□□□□□□□rrd□□□□

15.5.3　□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□3□□3□□□□□□□□15-6□


选择业务：
起始时间：
结束时间：
提 交
添加应用
京东首页 - 监测数据图表 [当前]
业务请求响应时间统计-京东首页
速度 (秒)
业务下载速度统计-京东首页
速度 (字节/秒)
业务可用性统计-京东首页
次数 (次)
京东首页 - 监测数据图表 [日]

选择业务：京东首页(电信)

总共时间	当前:369.25 ms	平均:481.34 ms	最大:2322.16 ms	最小:368.78 ms
域名解析	当前:0.07 ms	平均:8.78 ms	最大:30.72 ms	最小:0.00 ms
连接时间	当前:51.20 ms	平均:53.54 ms	最大:71.68 ms	最小:51.20 ms
开始传输	当前:51.20 ms	平均:53.83 ms	最大:81.72 ms	最小:51.20 ms
第一字节	当前:92.23 ms	平均:100.65 ms	最大:122.88 ms	最小:92.16 ms
(报警值)				

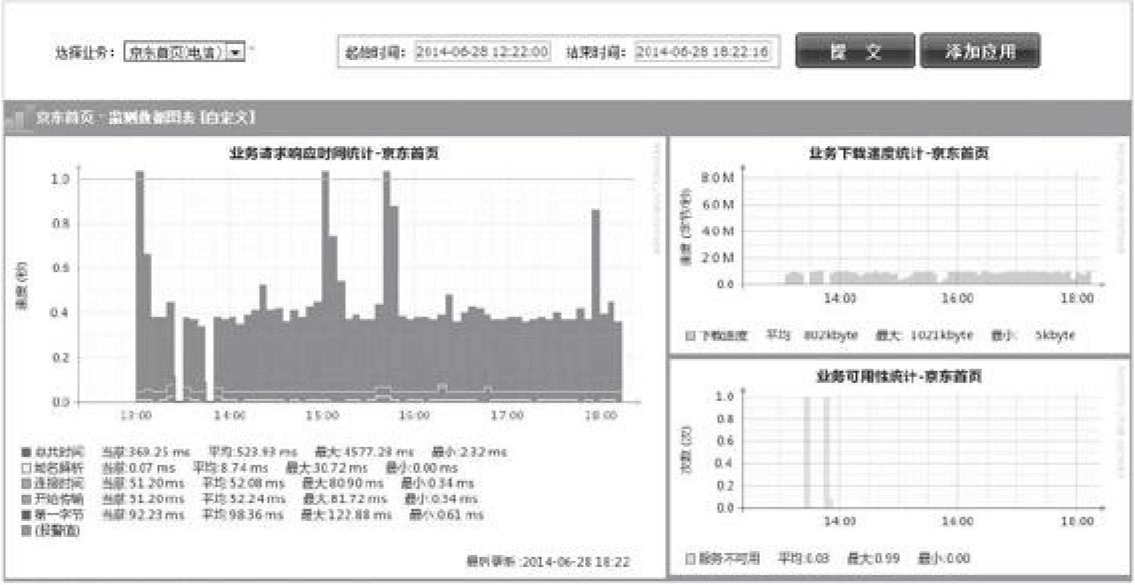
最后更新 :2014-06-28 18:23

下载速度 平均 851kbyte 最大 975kbyte 最小 158kbyte

服务不可用 平均:0.00 最大:0.00 最小:0.00

□15-6 □□□□“□□□□□3□□□”□□

□□□□□□□□□□□□□□□□rrdtool□□□□□□□15-7□□□


选择业务：
提 交
添加应用
京东首页 - 监测数据图表 [自定义]
业务请求响应时间统计-京东首页
速度 (秒)
业务下载速度统计-京东首页
速度 (字节/秒)
业务可用性统计-京东首页
次数 (次)

选择业务：京东首页(电信)

起始时间：2014-06-28 12:22:00 结束时间：2014-06-28 18:22:16

总共时间	当前:369.25 ms	平均:523.93 ms	最大:4577.28 ms	最小:2.32 ms
域名解析	当前:0.07 ms	平均:8.74 ms	最大:30.72 ms	最小:0.00 ms
连接时间	当前:51.20 ms	平均:52.08 ms	最大:80.90 ms	最小:0.34 ms
开始传输	当前:51.20 ms	平均:52.24 ms	最大:81.72 ms	最小:0.34 ms
第一字节	当前:92.23 ms	平均:98.36 ms	最大:122.88 ms	最小:0.61 ms
(报警值)				

最后更新 :2014-06-28 18:22

下载速度 平均 802kbyte 最大 1021kbyte 最小 5kbyte

服务不可用 平均:0.03 最大:0.99 最小:0.00

□15-7 □□□□□□□□

□□□□□□□□□□□□□graph□□□“--start”□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□“-3h□-1day□-1month□-1year”□□□“--end”□□□□□□□□□□□□□□□□□□□□□□□□□□□□“--start”□“--end”□□□□□rrdtool graph□□□□□□□□□□□□□□Python□rrdtool□□□□□□“--font”□□□□□□□□□□□□□□□□□rrdtool□□□□□□□Django□□□□□□os.system□□□□□□□□□□□□□□□□□

□/data/www/Servermonitor/webmonitor/graphrrd.sh□

```
#□/bin/sh

rrdfile=$1    #□□rrdtool□□□□

pngfile=$2    #□□□□png□□□□

rrdtype=$3    #□□rrd□□□□□□□□□□□□

appname=$4    #□□□□□□

GraphStart=$5    #□□rrdtool□□□□

GraphEnd=$6    #□□rrdtool□□□□

ymax=$7    #□□Y□□□□

Alarm=$8    #□□□□□□□

#□□□□□□

rrdtool_font_msyhbd="/data/www/Servermonitor/site_media/fon
t/msyhbd.ttf"

rrdtool_font_msyh="/data/www/Servermonitor/site_media/font/
```

```
msyh.ttf"

if [ "$rrdtype" == "time" ]□ then

/usr/local/rrdtool/bin/rrdtool graph ${pngfile} -w 500 -h
207 \

-n TITLE□9□${rrdtool_font_msyhbd} \    #□□□□□□

-n UNIT□8□${rrdtool_font_msyh} \    #□□Y□□□□□

-n LEGEND□8□${rrdtool_font_msyh} \    #□□□□□□

-n AXIS□8□${rrdtool_font_msyh} \    #□□□□□□□

-c SHADEA#808080 \    #□□□□□□

-c SHADEB#808080 \    #□□□□□□

-c FRAME#006600 \    #□□□□□□□□□□

-c ARROW#FF0000 \    #X□Y□□□□□

-c AXIS#000000 \    #X□Y□□□□

-c FONT#000000 \    #□□□□□□□□

-c CANVAS#eeffff \    #□□□□□□□□□□

-c BACK#ffffff \    #□□□□□□□□□□□□ □□

--title "□□□□□□□□□□-${appname}" -v "□□ □□□" \    #□□□□

--start ${GraphStart} \    #□□□□□□

--end ${GraphEnd} \    #□□□□□□

--lower-limit=0 \    #□□ Y □□□□

--base=1024 \    #□□1k□□□□□□□□□1000

-u ${ymax} -r  \    #□□Y□□□□

DEF□NAMELOOKUP_TIME=${rrdfile}□NAMELOOKUP_TIME□AVERAGE \
#□□□□□□□□□□
```

```
#□□□AVERAGE

DEF□CONNECT_TIME=${rrdfile}□CONNECT_TIME□AVERAGE \

DEF□PRETRANSFER_TIME=${rrdfile}□PRETRANSFER_TIME□AVERAGE \

DEF□STARTTRANSFER_TIME=${rrdfile}□STARTTRANSFER_TIME□
AVERAGE \

DEF□TOTAL_TIME=${rrdfile}□TOTAL_TIME□AVERAGE \

COMMENT□" \n" \

AREA□TOTAL_TIME#0011ff□□□□□ \    #□“□□”□□□□□□“□□□□”□□

#GPRINT□□□□□□□□□□□□□□TOTAL_TIME□□□□□□□□□LAST□□□□□□□□□□□

#□□□□□□□

#□□□□□□□□□□□□□□□

GPRINT□TOTAL_TIME□LAST□"□□\□%0.2lf %Ss"  \

GPRINT□TOTAL_TIME□AVERAGE□"□□\□%0.2lf %Ss"  \

GPRINT□TOTAL_TIME□MAX□"□□\□%0.2lf %Ss"  \

GPRINT□TOTAL_TIME□MIN□"□□\□%0.2lf %Ss"  \

COMMENT□" \n" \

LINE1□NAMELOOKUP_TIME#eeee00□□□□□ \    #□“□□”□□□□□□“□□□□”□□

GPRINT□NAMELOOKUP_TIME□LAST□"□□\□%0.2lf %Ss"  \

GPRINT□NAMELOOKUP_TIME□AVERAGE□"□□\□%0.2lf %Ss"  \

GPRINT□NAMELOOKUP_TIME□MAX□"□□\□%0.2lf %Ss"  \

GPRINT□NAMELOOKUP_TIME□MIN□"□□\□%0.2lf %Ss"  \

COMMENT□" \n" \
```

□“□□□□”□“□□□□”□“□□□□”□□□“□□□□”□□□□□□

```
HRULE□${Alarm}#ff0000□"□□□□□" \    #□□□□□□□

COMMENT□" \n" \

COMMENT□" \n" \

COMMENT□"\t\t\t\t\t\t\t\t\t\t□□□□ \□$□date '+%Y-%m-%d %H\□
%M'□\n"
```

□□□□□□□rrdtool graph□□□□□□□□□□

□□□□□png□□□□□□□□□□□□□

#□□□□□□□HTML□□

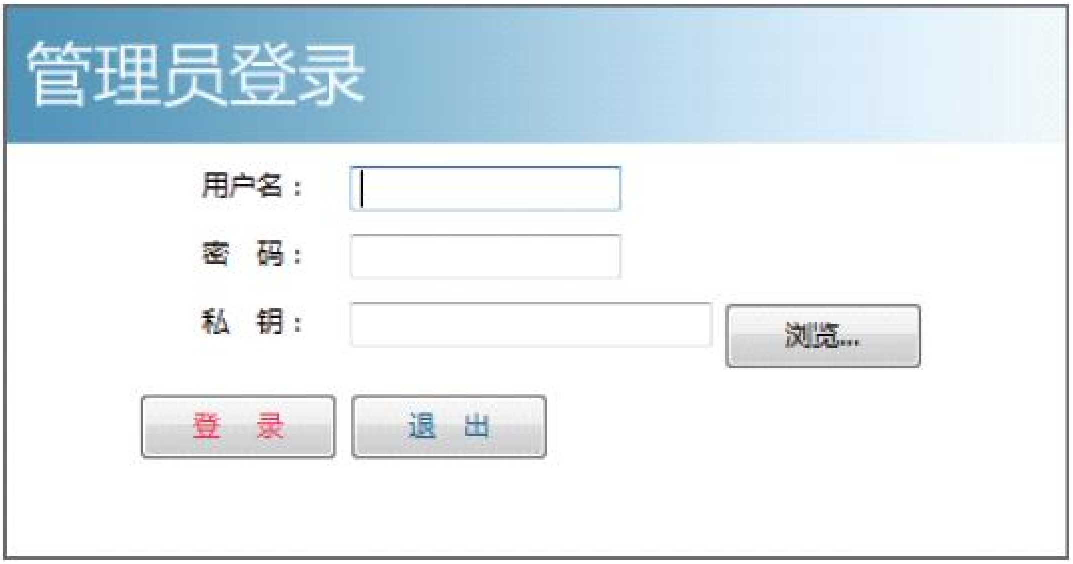
```
<img src="/site_media/rrdtool/www.baidu.com/15_time.png□□
Math.random□□□" width="597" />
```

□16□ □□□□□C/S□□□□□□□

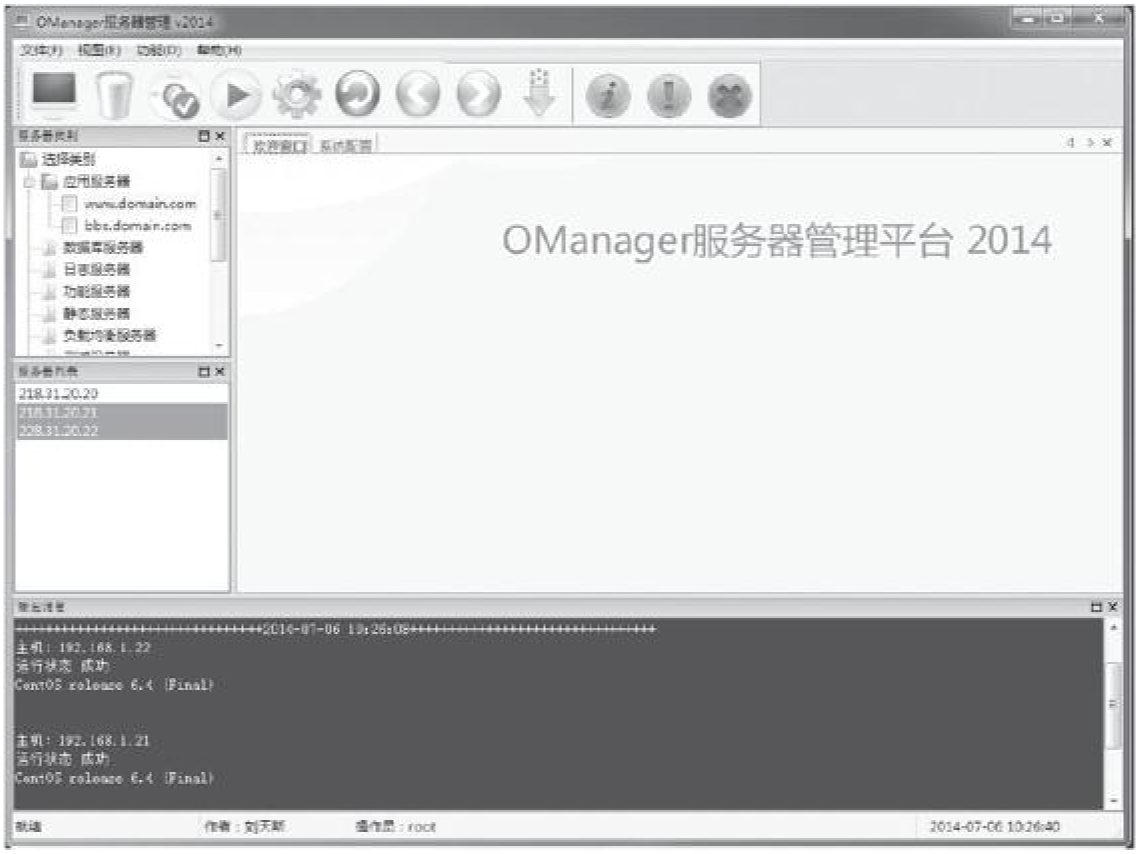
OManager□OMServer□□□□□□□□□□□□□□□□□OManager□□□C/S□□□□□□□□□□OMServer□B/S□□□Web□□□□□C/S□□□□□B/S□□API□□OManager□□□Python□wxpython GUI□□□□□□□□□□□□□□□□□□□□□□□Linux□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Windows XP□Windows 2000□Windows 2003□Windows 7□□□□Linux 2.6□□□□□□□Redhat□Ubuntu□□□□□□□□□□□□□□□□□

16.1 □□□□□□

□OMServer□□□OManager□□□□□□□□□□□Linux□□□□□□□□□□□□□□□□□□□□□□□□OManager□□□□□□□□□□□□□□□□□□□□XRC□XML Resource□□□□□□□□□□□□□□OMServer□□□□□□□□□□□OManager□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□RC4□□□Linux□□□□□□□□□□□□□□Psyco□□□Python□□□□□□□□□□□□□□□□□□□□□□□□□OManager□□□□□□□□□□□XML□□□□□□□□□□□□□□□□□□□□□□□□16-1□□16-2□



□16-1　□□□□□□



```
++++++++++++++++++++++++++++++++2014-07-06 10:26:08++++++++++++++++++++++++++++++++
主机: 192.168.1.22
运行状态 成功
CentOS release 6.4 (Final)


主机: 192.168.1.21
运行状态 成功
CentOS release 6.4 (Final)
```

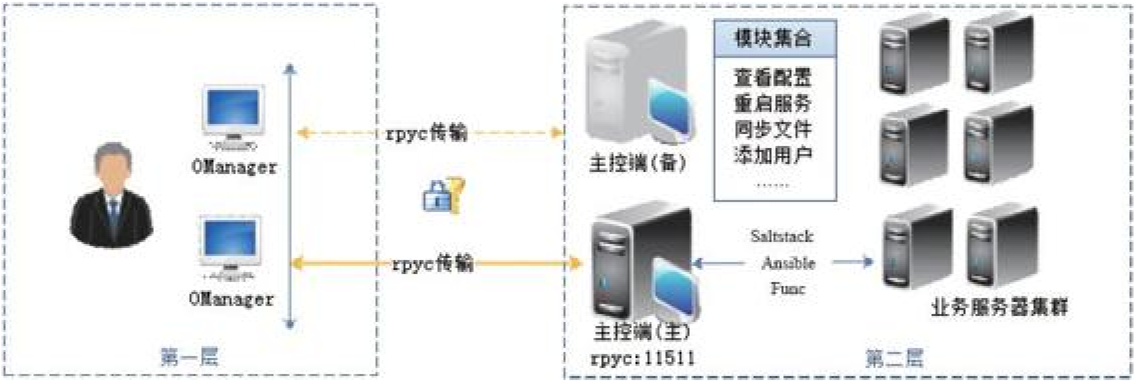
[illegible]16-2 [illegible]

16.2 □□□□□□

OManager□□□□□□□□□□□□

□□□□□□□□□□□□□□ wxpython+xrc+rpyc+MySQL□□□□□□□□□□□ □□□□□□□□□□□rpyc□□□□□□□□□□□□□□□□□□□□□ □RC4□□□□□□□□□□□□□□□□

□□□□□□□□□□□□□□□Saltstack□Ansible□Func□ □□□□□□□□□□□□□□□□□□□□□16-3□



□16-3 □□□□□

□□16-3□□□□□□□□□□□□□□□□□□□□□□□□□□□ OManager□□□□□□□□□rpyc□□□□rpyc□□□□□□□ □□□□□□□□□“RC4+b64encode+□□key”□□□ □□rpyc□□□□□□□□Saltstack□Ansible□Func□□ □□□□□□□□□□□□□□□“RC4+b64decode+□□ key”□□□□□□□□OManager□□□□□□□□□□ Saltstack□Ansible□Func□□□□□□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□/□□□□□□□□□□□□□□□□
□□□□□□□□□□□□□

16.3 □□□□□□□

16.3.1 □□□□□

OManager□□□□□□□□□□MySQL□□□□□□□□□□□
OManager□□□□□□□3□□□□□□□□□□□

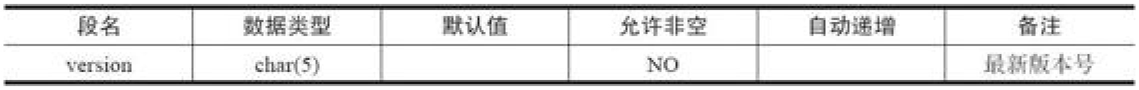
·upgrade□□□□□□□

·users□□□□□

·user_logs□□□□□□□

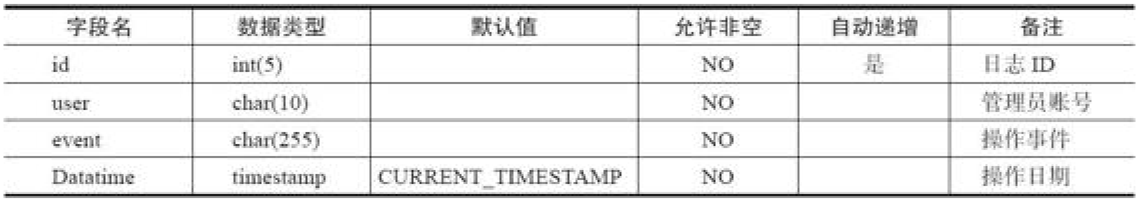
16.3.2 □□□□

1□upgrade□□□□□□



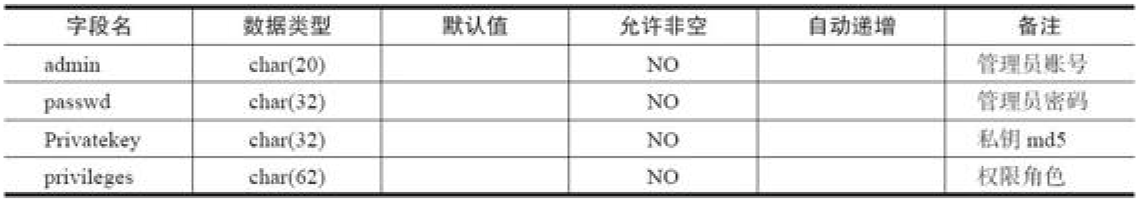
段名	数据类型	默认值	允许非空	自动递增	备注
version	char(5)		NO		最新版本号

2□user_logs□□□□□□



字段名	数据类型	默认值	允许非空	自动递增	备注
id	int(5)		NO	是	日志 ID
user	char(10)		NO		管理员账号
event	char(255)		NO		操作事件
Datatime	timestamp	CURRENT_TIMESTAMP	NO		操作日期

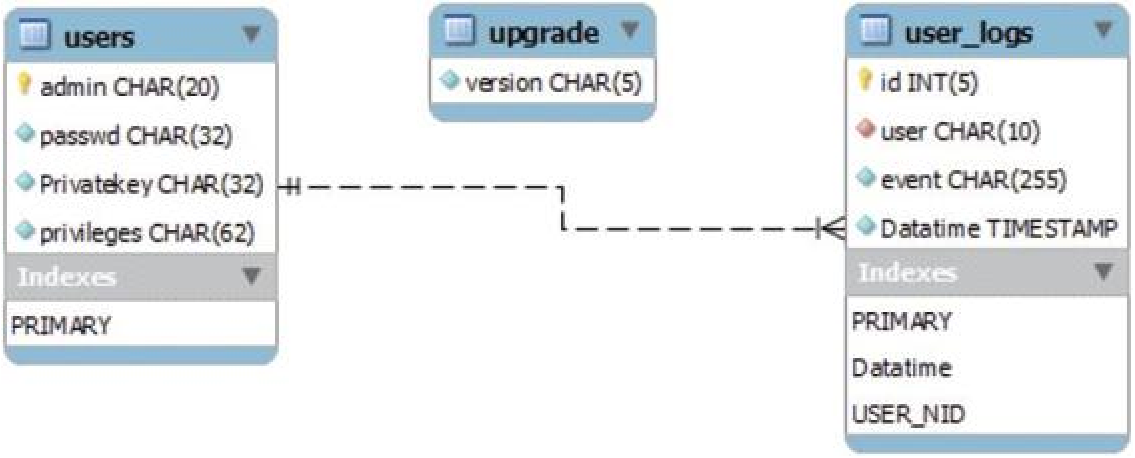
3□users□□□□



字段名	数据类型	默认值	允许非空	自动递增	备注
admin	char(20)		NO		管理员账号
passwd	char(32)		NO		管理员密码
Privatekey	char(32)		NO		私钥 md5
privileges	char(62)		NO		权限角色

16.3.3 □□□□□

□□□□□□□□□□OManager□□XML□□□□□□□users□□□□□□□□□□□□□user_logs□□□□□□□□□□□□□□□□□“user”□□□□□□users□□□“admin”□□□□□□□upgrade□□□OManager□□□□□□□□□□□□□□16-4□



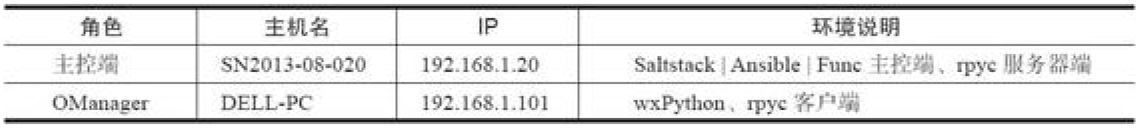
□16-4 □□□□□□□

16.4 [illegible]

16.4.1 [illegible]

OManager[illegible]wxPython2.8[illegible]rpyc-3.2.3[illegible]psyco-1.6[illegible]16-1[illegible]

[illegible]16-1 [illegible]



角色	主机名	IP	环境说明
主控端	SN2013-08-020	192.168.1.20	Saltstack | Ansible | Func 主控端、rpyc 服务器端
OManager	DELL-PC	192.168.1.101	wxPython、rpyc 客户端

16.4.2 [illegible]

OManager[illegible]Python[illegible]wxpython[illegible]rpyc[illegible]MySQL-python[illegible]psyco[illegible]pywin32[illegible]wxPython[illegible]demo[illegible]

·MySQL-python-1.2.4b4.win32-py2.7.exe[illegible]Python[illegible]MySQL[illegible]API[illegible]

·psyco-1.6.win32-py25.exe[illegible]Python[illegible]

·pyinstaller-2.0.zip□Python□□□□□□□□□□□□□□□Smart Install Maker□

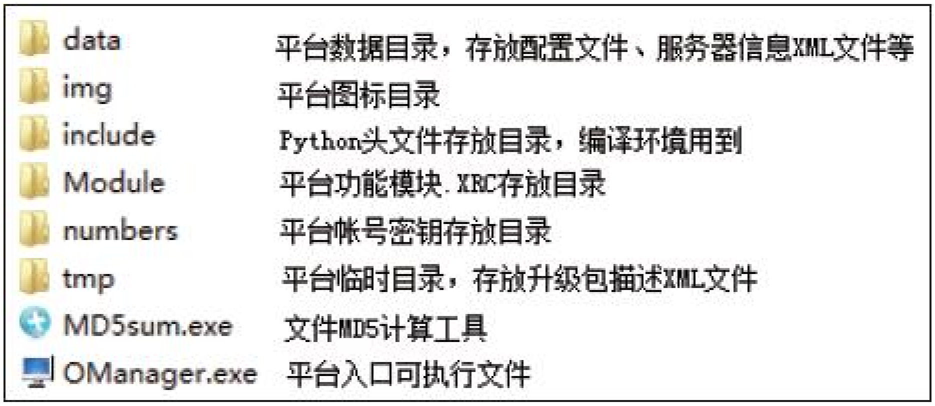
·pywin32-218.win32-py2.7.exe□Windows□□API□□□□

·rpyc-3.2.3.win32.exe□□□□□□□□□

·wxPython2.8-win32-docs-demos-2.8.12.1.exe□wxPython Demo□□□□□

·wxPython2.8-win32-unicode-2.8.12.1-py27.exe□Python GUI□□□□

□□□□□□□□□□□□□16-5□



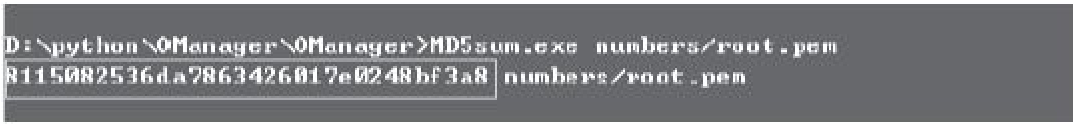
data	平台数据目录，存放配置文件、服务器信息XML文件等
img	平台图标目录
include	Python头文件存放目录，编译环境用到
Module	平台功能模块.XRC存放目录
numbers	平台帐号密钥存放目录
tmp	平台临时目录，存放升级包描述XML文件
MD5sum.exe	文件MD5计算工具
OManager.exe	平台入口可执行文件

□16-5　□□□□□□□□□

16.5 [illegible]

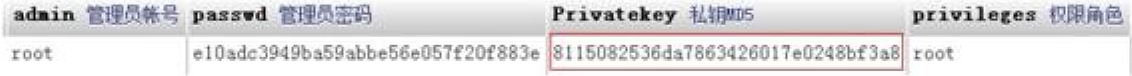
16.5.1 [illegible]

OManager[illegible]md5sum.exe[illegible] md5[illegible]md5[illegible]users[illegible]Privatekey[illegible]root[illegible] numbers/root.pem[illegible]16-6[illegible]16-7[illegible]



```
D:\python\OManager\OManager>MD5sum.exe numbers/root.pem
8115082536da7863426017e0248bf3a8 numbers/root.pem
```

[illegible]16-6 [illegible]md5



admin 管理员帐号	passwd 管理员密码	Privatekey 私钥MD5	privileges 权限角色
root	e10adc3949ba59abbe56e057f20f883e	8115082536da7863426017e0248bf3a8	root

[illegible]16-7 [illegible]md5[illegible]

[illegible]md5[illegible] Privatekey[illegible]

```
def Check[illegible]self[illegible]name[illegible] password[illegible]Privatekey[illegible]
    import md5
```

```
        m = md5.new□password□    #□□md5□□□□□□□md5□

        md5pass=m.hexdigest□□

        myrow=DBclass□□          #□□□□□□□□□□□□□□□

        sql = "select admin□privileges from users where
admin='%s' and

passwd='%s' \

        and Privatekey='%s'"% □name□ md5pass□Privatekey□
#□□MySQL□□□□□□


#□□□□□□□□□

        result = myrow.fetchallq□sql□

        return result    #□□□□□
```

□□□□□□□□md5□□□□□□□□□□hashlib□□□

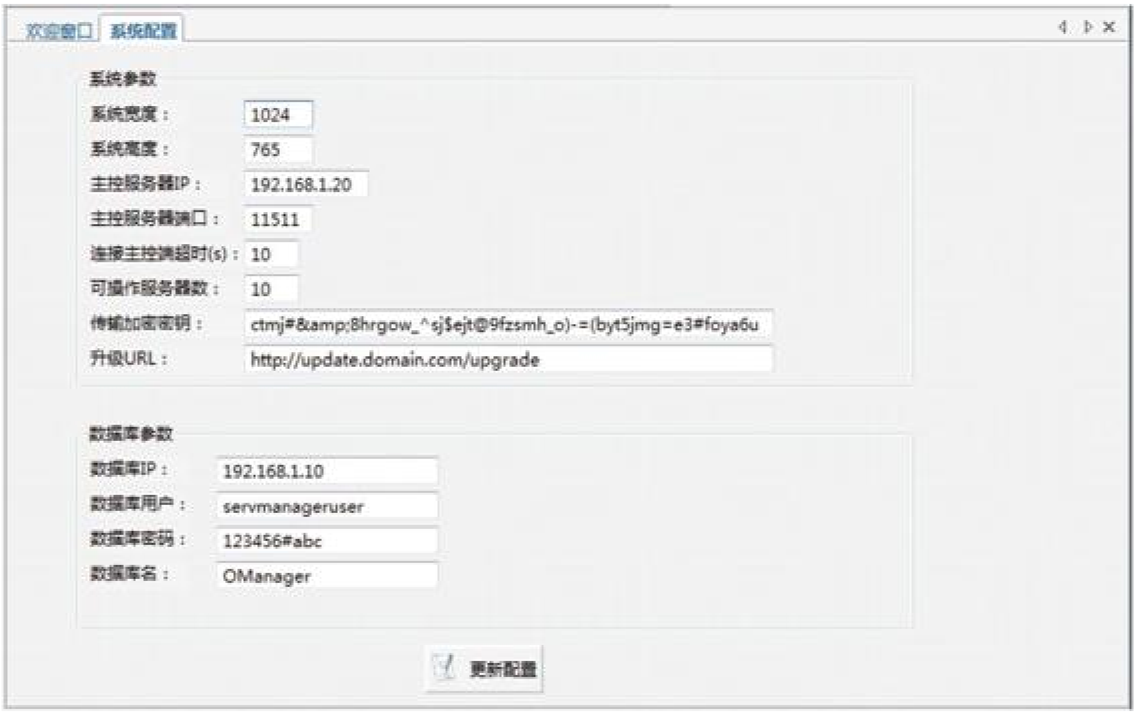
```
#□□□□md5□□□□fileName□□□□□□□□□□excludeLine□□□□□□□□

#□□includeLine□□□□□□□

def md5□fileName□ excludeLine=""□ includeLine=""□□

    m = hashlib.md5□□    #□□hashlib□□□□□□md5 hash□□

    try□

        fd = open□fileName□"rb"□    #□□□□□□

    except IOError□

        print "Unable to open the file in readmode□"□
filename

        return
    eachLine = fd.readline[illegible]

    while eachLine[illegible]    #[illegible]

        if excludeLine and eachLine.startswith
[illegible]excludeLine[illegible]    #[illegible]

            continue

        m.update[illegible]eachLine[illegible]    #[illegible]update[illegible]md5[illegible]
[illegible]

        eachLine = fd.readline[illegible]

    m.update[illegible]includeLine[illegible]    #[illegible]

    fd.close[illegible]

    return m.hexdigest[illegible]    #[illegible]
```

[illegible]md5[illegible]

```
md5[illegible]self.Privatekey.GetValue[illegible]
#self.Privatekey.GetValue[illegible]
```

16.5.2 [illegible]

OManager[illegible]ConfigParser[illegible]ini[illegible]16-8[illegible]



系统参数

系统宽度：1024

系统高度：765

主控服务器IP：192.168.1.20

主控服务器端口：11511

连接主控端超时(s)：10

可操作服务器数：10

传输加密密钥：ctmj#&amp;8hrgow_^sj$ejt@9fzsmh_o)-=(byt5jmg=e3#foya6u

升级URL：http://update.domain.com/upgrade

数据库参数

数据库IP：192.168.1.10

数据库用户：servmanageruser

数据库密码：123456#abc

数据库名：OManager

□16-8 □□□□□□

□□□□ini□□□□□□□□□□□□□□□□□□□ini□□□□□□□□data/config.ini□

```
[system]

height = 765

width = 1024

version = v2014

upversion = 10026

ip = 192.168.1.20

port = 11511

timeout = 10
```

```
max_servers = 10

secret_key = ctmj#&amp□8hrgow_^sj$ejt@9fzsmh_o□-=□byt5jmg=e3#foya6u

upgrade_url = http□//update.domain.com/upgrade

[db]

db_ip = 192.168.1.10

db_user = servmanageruser

db_pass = 123456#abc

db_name = OManager
```

□□ConfigParser□□□□ini□□□□□□□□□□□get□□□set□□□□□□□□□□□□□□□□□□□□□□□

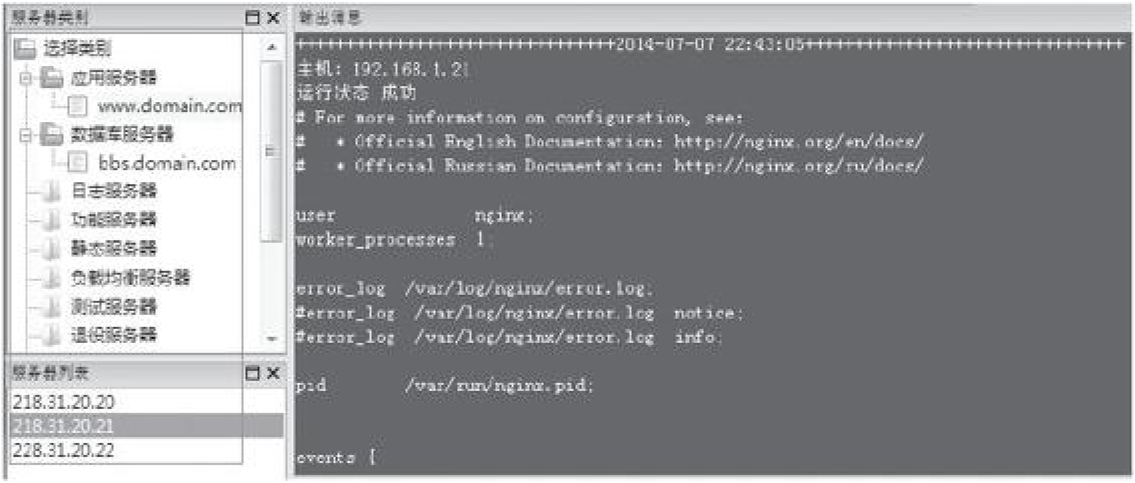
```
self.cf = ConfigParser.ConfigParser□□    #□□ConfigParser□□

self.cf.read□sys.path[0]+'/data/config.ini'□encoding='utf8'□     #□□□□□

#□□“system”□□□□□□□□□□

self.cf = ConfigParser.ConfigParser□□

self.cf.read□sys.path[0]+'/data/config.ini'□

self._syswidth= self.cf.get□"system"□"Width"□

self._sysheight= self.cf.get□"system"□"Height"□

self._timeout=self.cf.get□"system"□"Timeout"□

self._ip=self.cf.get□"system"□"IP"□

self._port=self.cf.get□"system"□"Port"□
self._max_servers=self.cf.get□"system"□"max_servers"□

self._secret_key=self.cf.get□"system"□"secret_key"□

self._sysversion= self.cf.get□"system"□"Version"□

self._sysUpversion= self.cf.get□"system"□"Upversion"□

self._upgrade_url= self.cf.get□"system"□"upgrade_url"□

#□□“db”□□□□□□□□□□□□

self._db_ip= self.cf.get□"db"□"db_ip"□

self._db_user= self.cf.get□"db"□"db_user"□

self._db_pass= self.cf.get□"db"□"db_pass"□

self._db_name= self.cf.get□"db"□"db_name"□
```

□□□□□□□□□□□get□□□□□□□set□□□□□□ini□□□□□□□□□□□□□□□□□□□□□IP□□□□□□□□self.DB_ip.GetValue□□□□□□□□□□

```
self.cf.set□"db"□ "db_ip"□ self.DB_ip.GetValue□□□
```

16.5.3 □□□□□□□

□□□OManager□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□XML□□□□□Tree□ListBox□□□□□□□□□□□□□□□□□□□16-9□

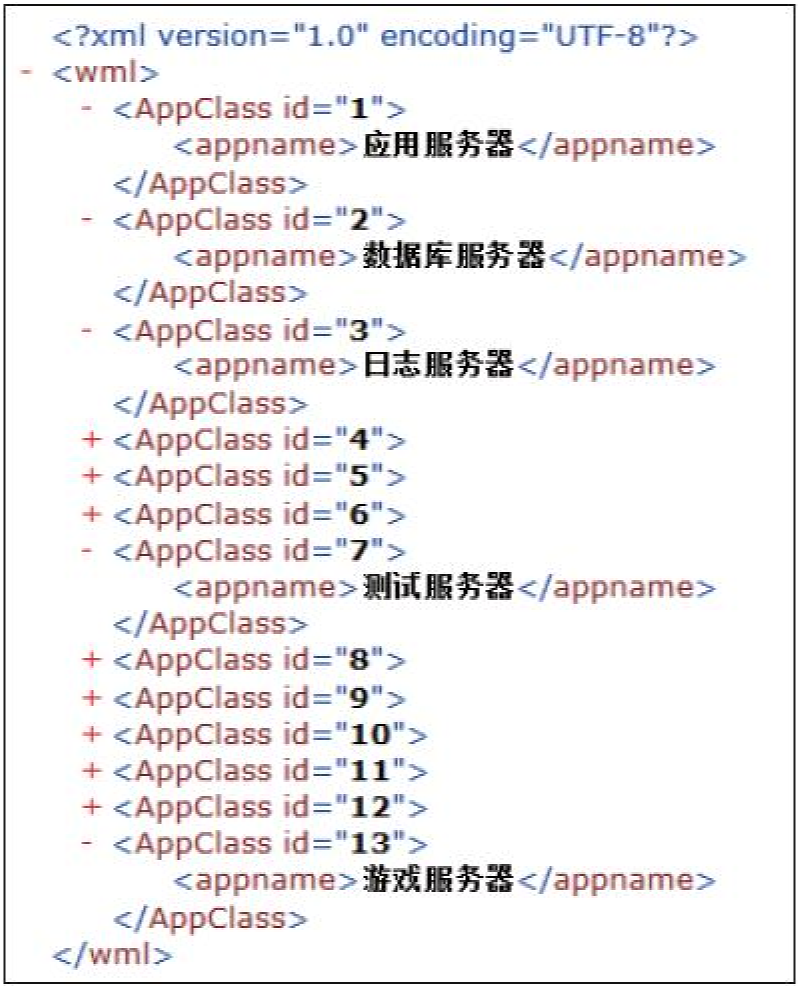


```
++++++++++++++++++++++++++++++++++2014-07-07 22:43:05++++++++++++++++++++++++++++++++++
主机: 192.168.1.21
运行状态 成功
# For more information on configuration, see:
#   * Official English Documentation: http://nginx.org/en/docs/
#   * Official Russian Documentation: http://nginx.org/ru/docs/

user              nginx;
worker_processes  1;

error_log  /var/log/nginx/error.log;
#error_log  /var/log/nginx/error.log  notice;
#error_log  /var/log/nginx/error.log  info;

pid        /var/run/nginx.pid;


events {
```

□16-9　□□□□□□□

□□□□□□□□□□□OMserver□□□□□□□□□□→□□□□→□□□□□16-10□□□□□□□XML□□□□□□□□□□□□□□□□□

□data/ServerOptioninfo.xml□

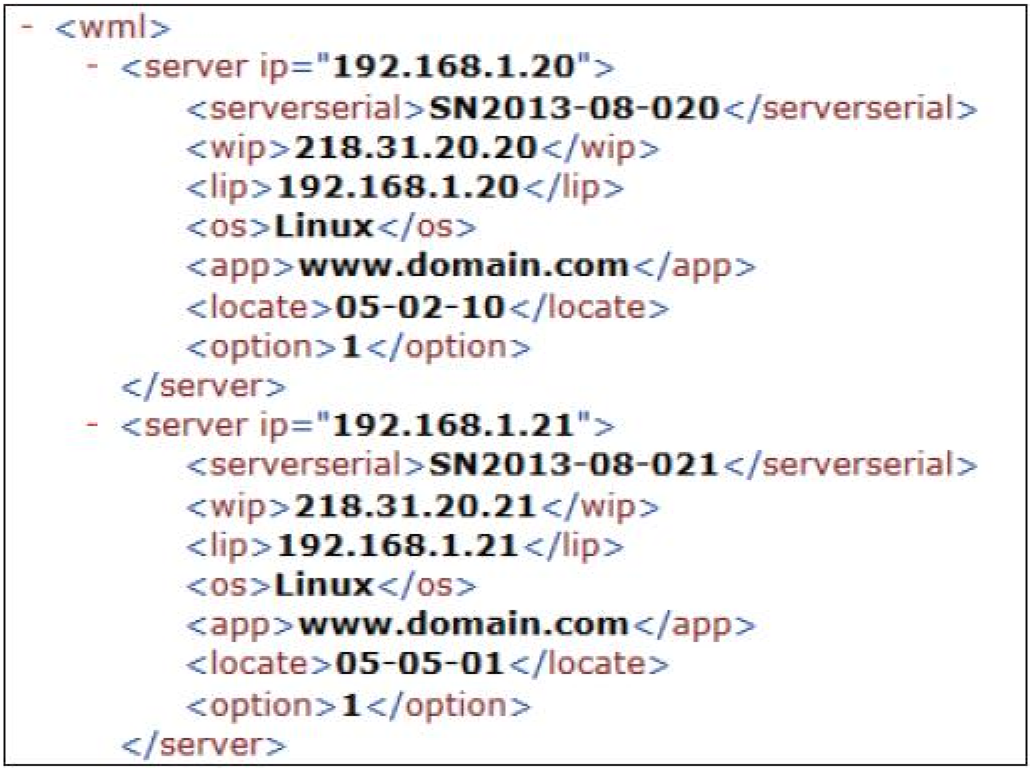


```
  <?xml version="1.0" encoding="UTF-8"?>
- <wml>
  - <AppClass id="1">
        <appname>应用服务器</appname>
    </AppClass>
  - <AppClass id="2">
        <appname>数据库服务器</appname>
    </AppClass>
  - <AppClass id="3">
        <appname>日志服务器</appname>
    </AppClass>
  + <AppClass id="4">
  + <AppClass id="5">
  + <AppClass id="6">
  - <AppClass id="7">
        <appname>测试服务器</appname>
    </AppClass>
  + <AppClass id="8">
  + <AppClass id="9">
  + <AppClass id="10">
  + <AppClass id="11">
  + <AppClass id="12">
  - <AppClass id="13">
        <appname>游戏服务器</appname>
    </AppClass>
  </wml>
```

□16-10 □□□□□XML□□

□□□“<AppClass id="1">”□□id□□□□□□□□ID □□“<appname>□□□□□</appname>”□□ <appname>□□□□□□□□□□□□□□□□□□XML□□□ □□□□□□□□□□□□□□□□□□□□16-11□□□□□□□□□□□ 16-2□

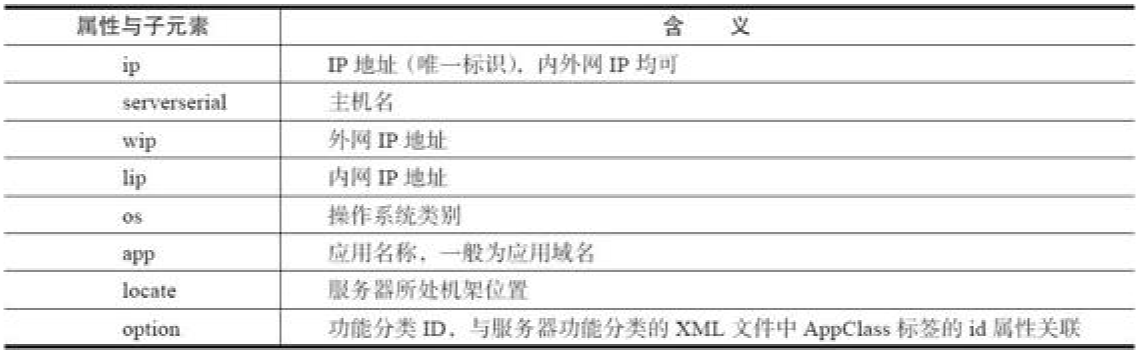
□data/Serverinfo.xml□□□□□□□



```
- <wml>
  - <server ip="192.168.1.20">
        <serverserial>SN2013-08-020</serverserial>
        <wip>218.31.20.20</wip>
        <lip>192.168.1.20</lip>
        <os>Linux</os>
        <app>www.domain.com</app>
        <locate>05-02-10</locate>
        <option>1</option>
    </server>
  - <server ip="192.168.1.21">
        <serverserial>SN2013-08-021</serverserial>
        <wip>218.31.20.21</wip>
        <lip>192.168.1.21</lip>
        <os>Linux</os>
        <app>www.domain.com</app>
        <locate>05-05-01</locate>
        <option>1</option>
    </server>
```

□16-11　□□□□□□XML□□

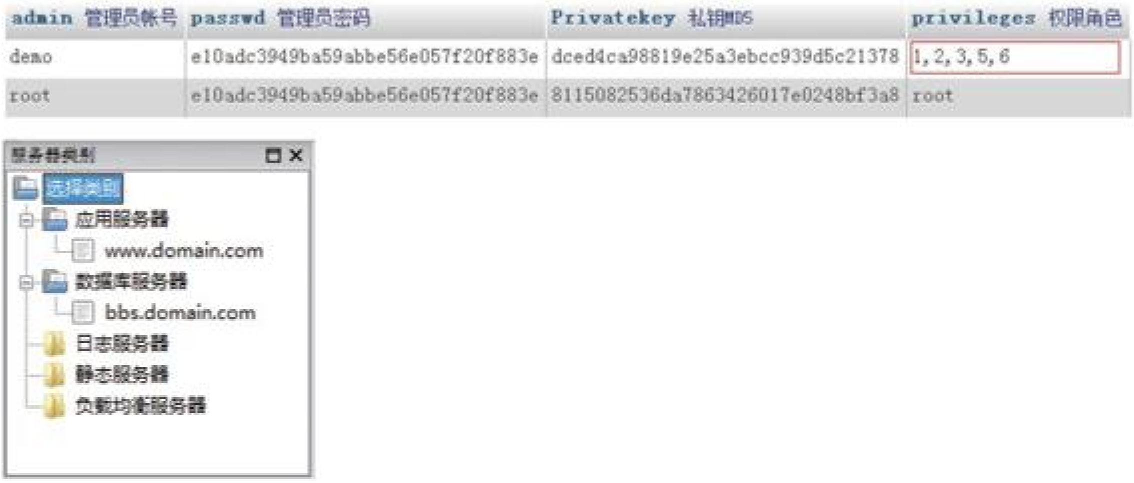
□16-2　□□□□□□□□



属性与子元素	含　义
ip	IP 地址（唯一标识），内外网 IP 均可
serverserial	主机名
wip	外网 IP 地址
lip	内网 IP 地址
os	操作系统类别
app	应用名称，一般为应用域名
locate	服务器所处机架位置
option	功能分类 ID，与服务器功能分类的 XML 文件中 AppClass 标签的 id 属性关联

□□OManager□□□□□□□□□□□□□□□□□□□□□□users□□privileges□□□□□□□□□□□□□□□□□ID□□□“root”□

□□□□□□□□□□□□□□□□□□□□□□□□□□“demo”□□□□□□□□□□□□□□□□□□□16-12□



admin 管理员帐号	passwd 管理员密码	Privatekey 私钥MD5	privileges 权限角色
demo	e10adc3949ba59abbe56e057f20f883e	dced4ca98819e25a3ebcc939d5c21378	1,2,3,5,6
root	e10adc3949ba59abbe56e057f20f883e	8115082536da7863426017e0248bf3a8	root

□16-12　□□□□□□□□□□□

□□□□wx.Frame□□□□□□“□□□□□”□□□□□□□□□□□□□□□□□□□□□□□□□□□XML□□□□□□□□□□□ID□□□□□□□□ID□□□□□□□□□□□□□□□□□□□□□□ID□“□□□□”□□□□□□□□□“<option>”□□□□□□□□ID□□□□□□□□□□□□

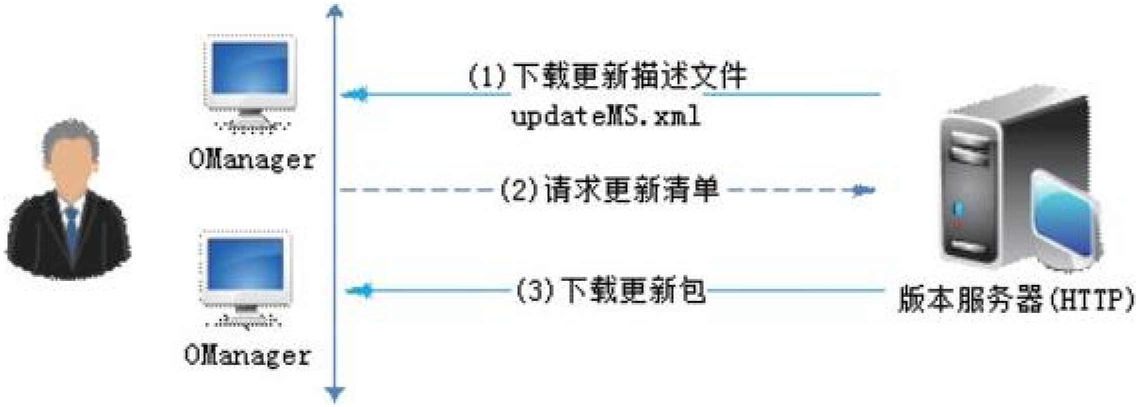
```
import xml.etree.ElementTree as ET

import os

import sys

root_tree = ET.parse
□sys.path[0]+'/data/ServerOptioninfo.xml'□ #□□□□□□XML□□

class_tree = ET.parse
□sys.path[0]+'/data/Serverinfo.xml'□     #□□□□□□XML□□

root_doc = root_tree.getroot□□    #□□□□□□XML□□root□□
```

```
class_doc = class_tree.getroot□□  #□□□□□□□XML□□root□□

class ServerClassList□□□

    def Resurn_list□self□UserPrivileges□□    #□□□□□□□□□□□□

        ServerList_KEY=[]    #□□□□□□□□□□□□□□□□□□□

        serverclass=[]       #□□□□□□□□□□□

        serverapp=[]         #□□□□□□□□□□

        for root_child in root_doc□    #□□□□□□□□□

            if not root_child.get□'id'□ in UserPrivileges
and not

UserPrivileges[0]=="root"□

                continue    #□□□□□□□□□□□□□□

            serverclass.append□root_child[0].text.encode
□'gbk'□□ #□□□□□□


      #□□□<appname>

            serverapp=[]

            for class_child in class_doc□    #□□□□□□□□□

                #□□□□□□ID□□□□□□□<app>□serverapp

                #□□index□□□□□□□□□□□□□<app>□□□□□□□serverapp□

                if class_child[6].text==root_child.get
□'id'□□

                    try□

                        serverapp.index
□class_child[4].text.encode□'gbk'□□

                    except□
```

```
                        serverapp.append
□class_child[4].text.encode□'gbk'□□

            serverclass.append□serverapp□

            ServerList_KEY.append□serverclass□

            serverclass=[]

#□□□□□□□□[['□□□□□'□['www.a.com'□'www.b.com']]□['□□□□□□'□
['www.c.com']]...]

        return ServerList_KEY
```

16.5.4 □□□□□□

□□B/S□□□□□C/S□□□OManager□□□□□□□□□□B/S□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□OManager□□□□□□□□□□OManager□□□□□□□□□16-13□



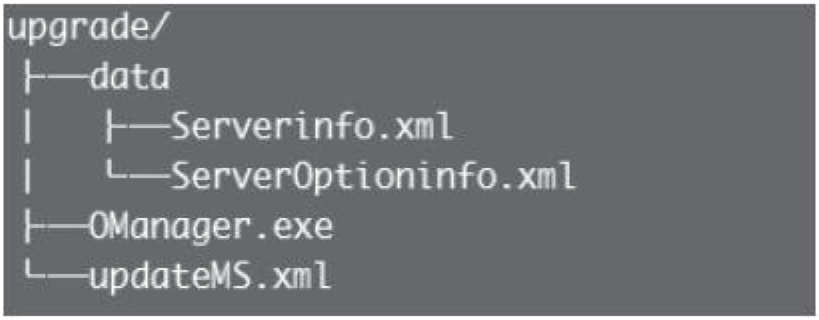
□16-13 □□□□□□

OManager□□□□□□□□□□□□□□□□□□□updateMS.xml□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□urllib□□□□HTTP□□□□updateMS.xml□□□□□□□□□□□□□□□□□□□□□□□□□URL□□updateMS.xml□□□□

□tmp/updateMS.xml□

```
<□xml version="1.0" encoding="UTF-8"□>
<wml>
<AppClass id="1">
    <localsrc>data/Serverinfo.xml</localsrc>
    <remotesrc>/data/Serverinfo.xml</remotesrc>
</AppClass>
<AppClass id="2">
    <localsrc>data/ServerOptioninfo.xml</localsrc>
    <remotesrc>/data/ServerOptioninfo.xml</remotesrc>
</AppClass>
<AppClass id="3">
    <localsrc>OManager.10026.exe</localsrc>
    <remotesrc>/OManager.exe</remotesrc>
</AppClass>
</wml>
```

□□XML□□□□localsrc□remotesrc□□□□□□□□□□□□□URL□□□□□URL□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□“data/Serverinfo.xml”□□□□“/data/Serverinfo.xml”□□□□□□□□□□□□16-14□



```
upgrade/
 ├──data
 |    ├──Serverinfo.xml
 |    └──ServerOptioninfo.xml
 ├──OManager.exe
 └──updateMS.xml
```

□16-14　□□□□□□□□□

□□□□□□□□□□□□□□□OManager.exe□Serverinfo.xml□ServerOptioninfo.xml□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

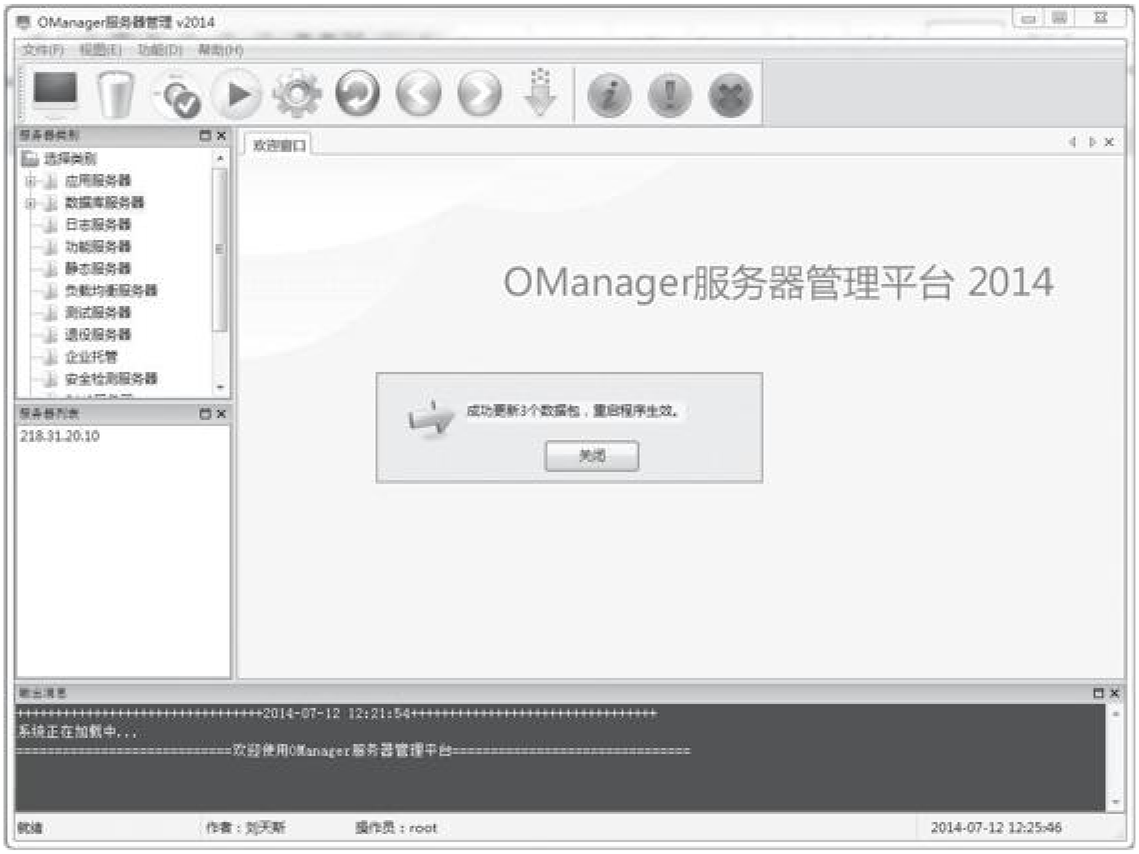
1□□□□□□□□□□□□□□□□□□□□□□□□16-14□

2□□□□□□□□□□□□□□□□□□upgrade□□version□□□□□□□□□□“10026”□□□□□□data/config.ini□□upversion□□□□□□□□□□□□□□□□□□□□□□□□□□□□

3□□□“□□□□”□□□□□□□□□□□□□□□□16-15□□□

□□□□□□□□□□□□□□□□□“OManager.10026.exe”□□□□□□□□□□□16-16□

□□“OManager.10026.exe”□□□□□□□□□□□□□□□□□□□“218.31.20.11”□□□□□16-17□□□□data/config.ini□□upversion□□□□□□□“10026”□□□□□□□□□□□



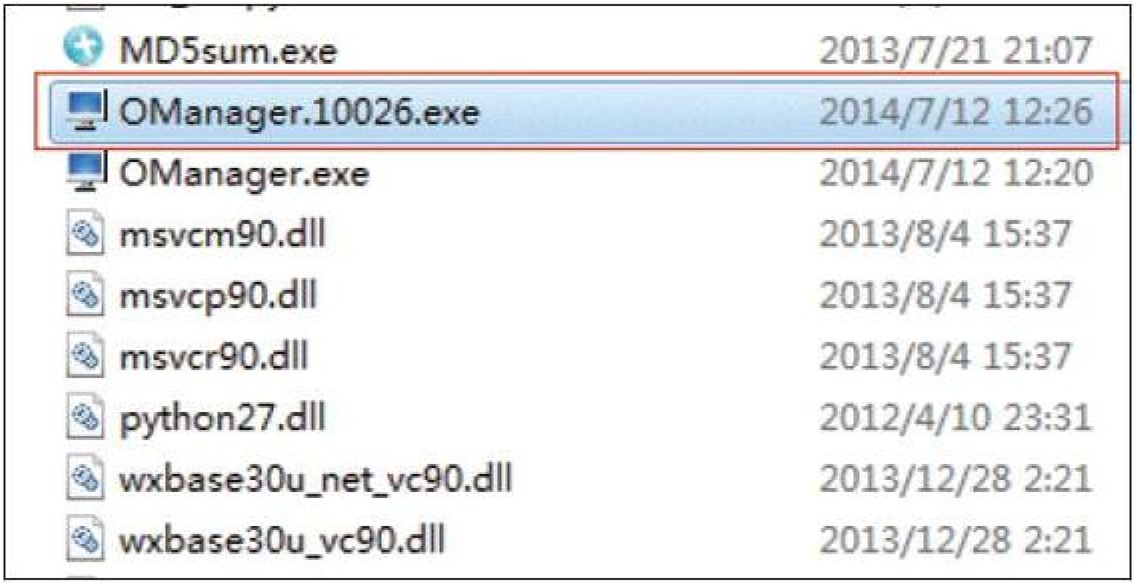
218.31.20.10

成功更新3个数据包，重启程序生效。

```
++++++++++++++++++++++++++++++++2014-07-12 12:21:54++++++++++++++++++++++++++++++++++
系统正在加载中...
============================欢迎使用OManager服务器管理平台================================
```

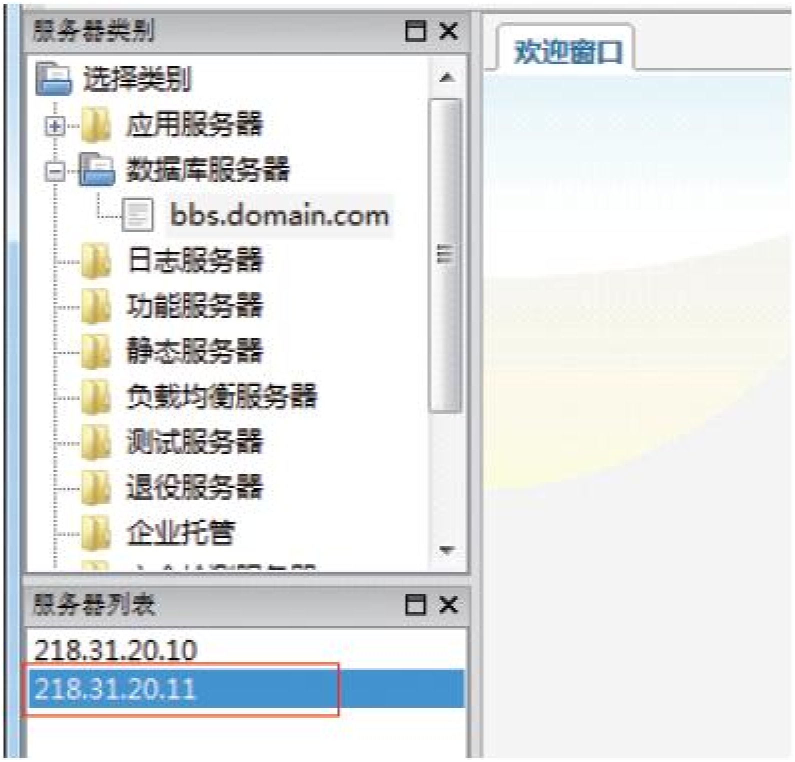
就绪　作者：刘天斯　操作员：root　2014-07-12 12:25:46

□16-15　□□□□□



MD5sum.exe	2013/7/21 21:07
OManager.10026.exe	2014/7/12 12:26
OManager.exe	2014/7/12 12:20
msvcm90.dll	2013/8/4 15:37
msvcp90.dll	2013/8/4 15:37
msvcr90.dll	2013/8/4 15:37
python27.dll	2012/4/10 23:31
wxbase30u_net_vc90.dll	2013/12/28 2:21
wxbase30u_vc90.dll	2013/12/28 2:21

□16-16 □□□□□□□□



□16-17 □□□□□□□□

□□□□□□□□□□□□□□□□□OManager□□□□□□□□□□□□□□□□urllib.urlopen□url□.read□□□□□□HTTP□□□□□□□□□xml.etree.ElementTree□□□□XML□□□□□□

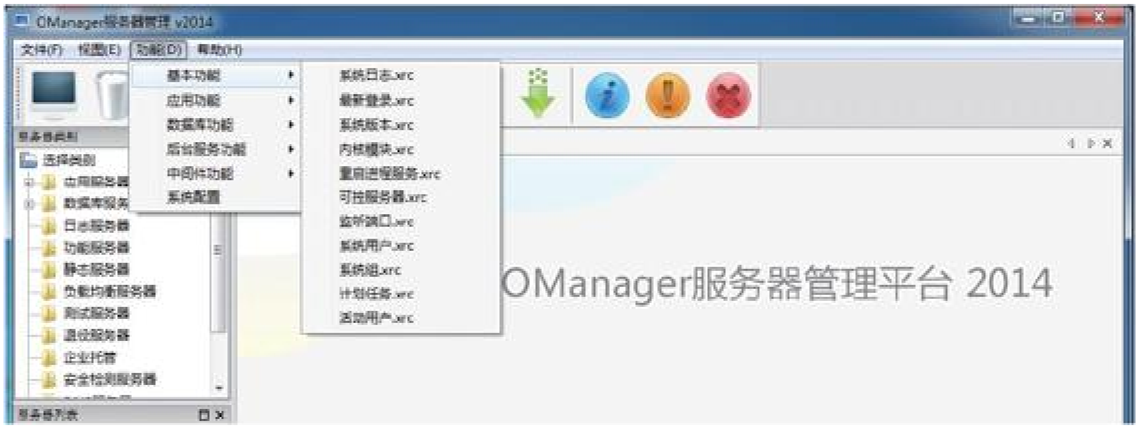
```
    def load_data□self□event□□    #□□□□□□

        try□

            if self.button.GetLabel□□==u"□□"□

                self.Destroy□□

            url=self.updateURL+"/updateMS.xml"    #□□□□□□□□
□□□□□□□

            localfile=sys.path[0]+'/tmp/updateMS.xml'

            if not self.download□url□localfile□□    #□□□□□□
□□

                return

        except Exception□e□

            wx.MessageBox□u"□□□□□□□□□□"+str□e□□
u"OManager□"□style=wx.

OK|wx.ICON_ERROR□

            self.Destroy□□

            return

        try□    #□□□□□□□□□□□□□□□□□□□

            import xml.etree.ElementTree as ET

            update_tree = ET.parse
□sys.path[0]+'/tmp/updateMS.xml'□
```

```
            up_doc = update_tree.getroot□□

        except Exception□e□

            wx.MessageBox□u"□□□□□□□"□u"OManager□"□
style=wx.OK|wx.ICON_ERROR□

            self.Destroy□□

            return

        try□     #□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

                 #download□□□□□□□□

            upgrade_count=0

            for cur_child in up_doc□

                upgrade_count+=1

                url=self.updateURL+cur_child[1].text

                localfile=sys.path[0]+'/'+cur_child[0].text

                if self.download□url□localfile□==False□

                    break

            self.cf.set□"system"□ "Upversion"□
self.lastversion□ #□□config.ini


     #□□□□□

            self.cf.write□open
□sys.path[0]+'/data/config.ini'□ "w"□□

            self.ConnStaticText.SetLabel□u"□□□□"+str
□upgrade_count□+"□□□□..."□

            self.button.SetLabel□u"□□"□

        except Exception□e□
```

```
            wx.MessageBox[illegible]u"[illegible]"[illegible]"OManager"[illegible]
style=wx.OK|wx.ICON_ERROR[illegible]

            self.Destroy[illegible]

            return

        finally[illegible]

            pass

        event.Skip[illegible]
```

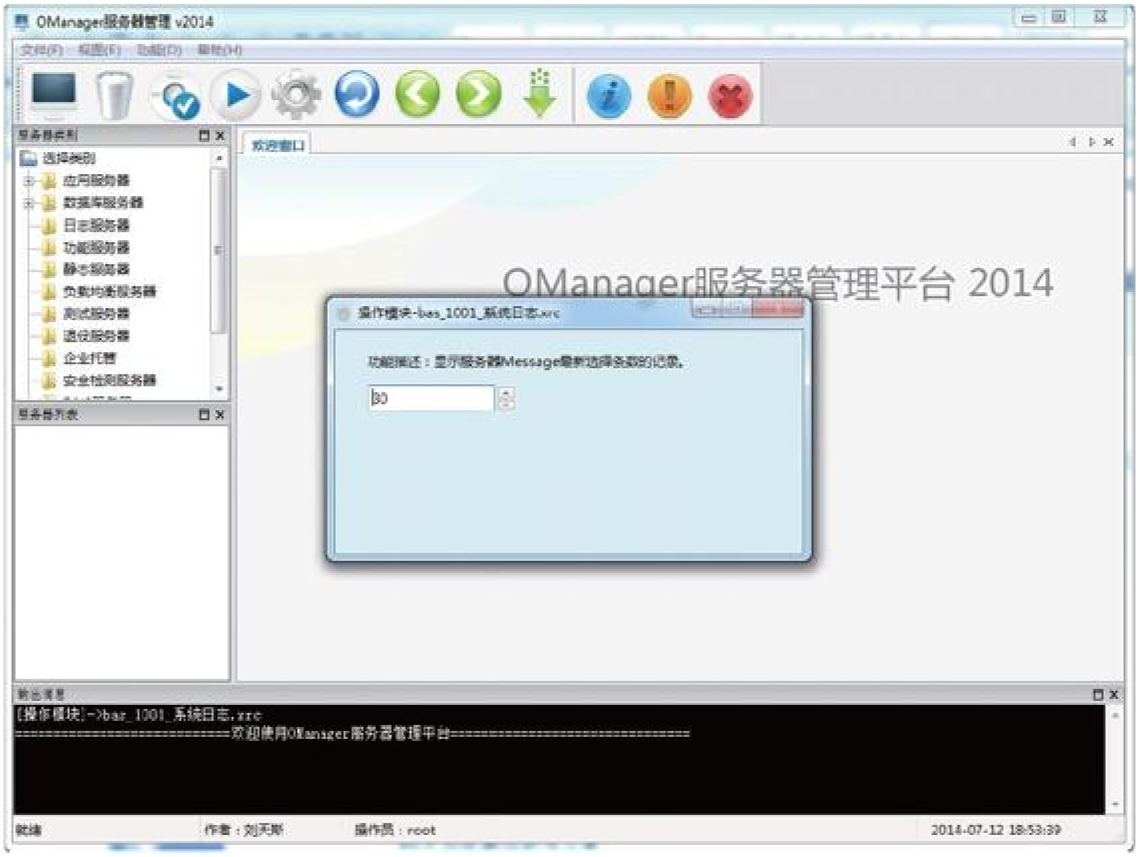
16.5.5 [illegible]

OManager[illegible]OMserver[illegible]OMserver[illegible]HTML[illegible]OManager[illegible]XRC[illegible]XRC[illegible]XML Resource[illegible]wxWidgets[illegible]Django[illegible]XML[illegible]XRC[illegible]http://wiki.wxwidgets.org/Using_XML_Resources_with_XRC[illegible]OManager[illegible]XRC[illegible]16-18[illegible]16-19[illegible]



[illegible]16-18 [illegible]

OManager[illegible]2[illegible]wxSpinCtrl[illegible]wxListBox[illegible]wxTextCtrl[illegible]rpyc[illegible]“bas_1001_[illegible].xrc”[illegible]wxPanel[illegible]wxPanel[illegible]wxStaticText[illegible]<label>[illegible]wxSpinCtrl[illegible]<value>[illegible]<min>[illegible]<max>[illegible]http://wiki.wxwidgets.org/Using_XML_Resources_with_XRC[illegible]XRC[illegible]



功能描述：显示服务器Message最新选择条数的记录。

30

```
[操作模块]->bas_1001_系统日志.xrc
============================欢迎使用OManager服务器管理平台================================
```

□16-19 □□□□□

□Module/bas_1001_□□□□.xrc□

```
<□xml version="1.0" encoding="utf-8"□>
<resource>
        <object class="wxPanel" name="panel">
            <size>200□100</size>
                <object class="wxStaticText" name="label1">
                    <label>□□□□□□□□□□Message□□□□□□□□□□</label>
                    <pos>30□20</pos>
```

```
                 </object>

        <object class="wxSpinCtrl"
name="Parameter1_object_id">

          <style>wxSP_ARROW_KEYS</style>

              <value>30</value>

              <min>1</min>

              <max>100</max>

              <pos>30□50</pos>

          </object>

       </object>

</resource>
```

□□□□□□□□xrc.XmlResource□□□□□□XRC□□□□□□□xrc.XRCCTRL□□□□□□□□□□□□□□□□GetValue□□□GetStringSelection□□□□□□□□□□□□□□wxSpinCtrl□wxTextCtrl□□□□GetValue□□□□□wxListBox□□□□GetStringSelection□□□□□□□□□□□□XRC□□□□□□□□□□□□□

```
from wx import xrc

self.res = xrc.XmlResource□sys.path[0]+'/Module/bas_1001_□□
□□.xrc'□

#□□□□□□□□

panel = self.res.LoadPanel□self□ "panel"□    #□□panel□□□□

try□
```

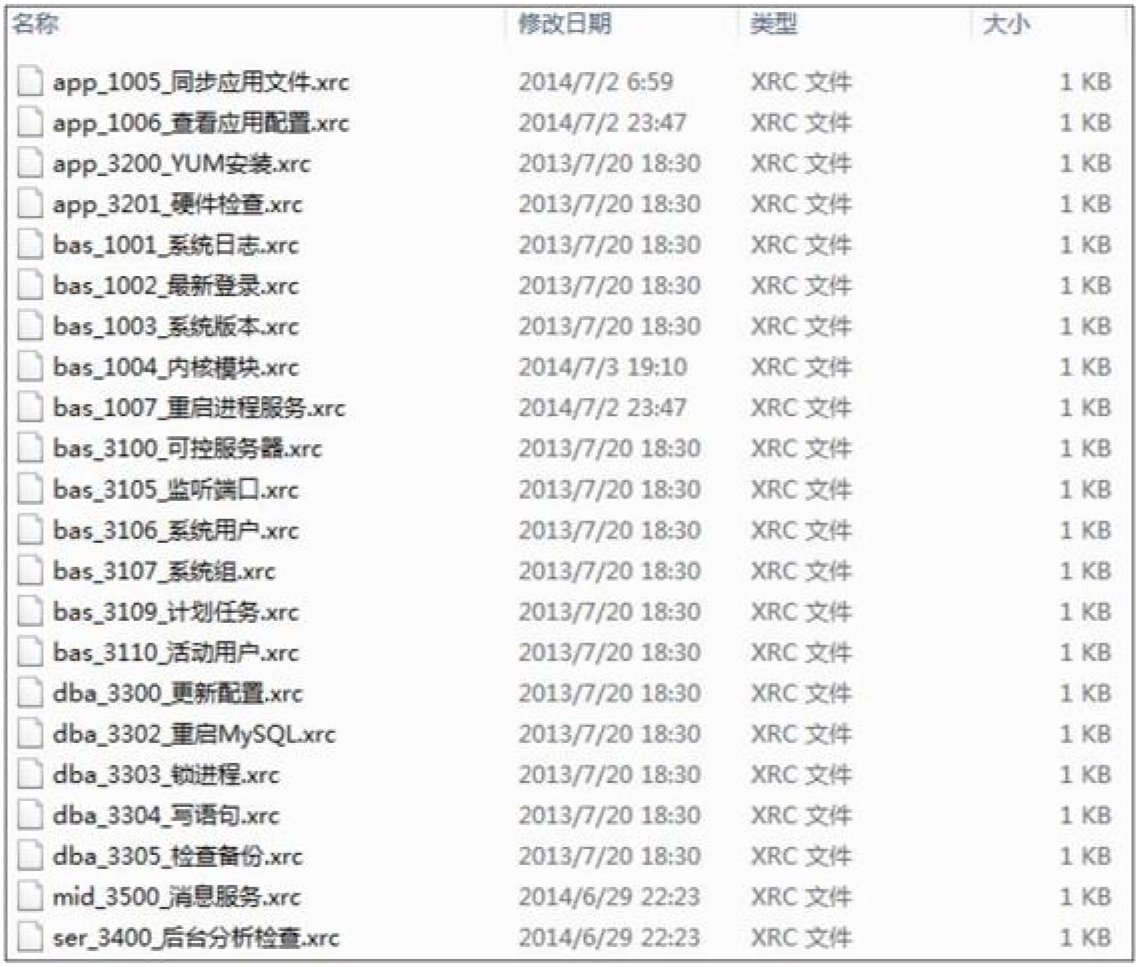
```
    self.Parameter1 = xrc.XRCCTRL□panel□
'Parameter1_object_id'□  #□□□□1□□□

except Exception□e□

    pass

#□□□□□□□□□□□GetClassName□□□□□□□□□□□□□□□□□□□□□□value□□□

try□

    if self.Parameter1.GetClassName□□=="wxSpinCtrl"□

       self.Parameter1_value=self.Parameter1.GetValue□□

    elif self.Parameter1.GetClassName□□=="wxListBox"□


self.Parameter1_value=self.Parameter1.GetStringSelection□□

except Exception□e□

pass

…
```

□□□□□□XRC□□□□□□□□□□□□□□□“□□□□□□_□□ID_□□□□□□.xrc”□□□□□□□“_”□□□□□□□□□□□□□□□□□□□□□□□□□□□“□□□□□□”□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

```
bashmenu = wx.Menu□□       #□□"□□□□"□□□□

appmenu = wx.Menu□□        #□□"□□□□"□□□□

dbmenu = wx.Menu□□         #□□"□□□□□"□□□□

servicemenu = wx.Menu□□    #□□"□□□□□□"□□□□
```

```
middlemenu = wx.Menu□□     #□□"□□□□□"□□□□

#□□□□XRC□□□□□□□□□□□□□□□□□□□□□

for file_info in self.Moduledetail□

    file_array=string.split□file_info□'_'□

    if file_info[0□3]=="bas"□

        bashmenu.Append□int□file_array[1]□□file_array[2]□
file_array[2]□

    elif file_info[0□3]=="app"□

        appmenu.Append□int□file_array[1]□□file_array[2]□
file_array[2]□

    elif file_info[0□3]=="dba"□

        dbmenu.Append□int□file_array[1]□□file_array[2]□
file_array[2]□

    elif file_info[0□3]=="ser"□

        servicemenu.Append□int□file_array[1]□□
file_array[2]□file_array[2]□

    elif file_info[0□3]=="mid"□

        middlemenu.Append□int□file_array[1]□□file_array[2]□
file_array[2]□
```

□□“□□ID”□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□XRC□□□□□□□□□Module□□□□□□□□□□□□□□□□□□□ID□“100*”□□□XRC□□□□□□16-20□

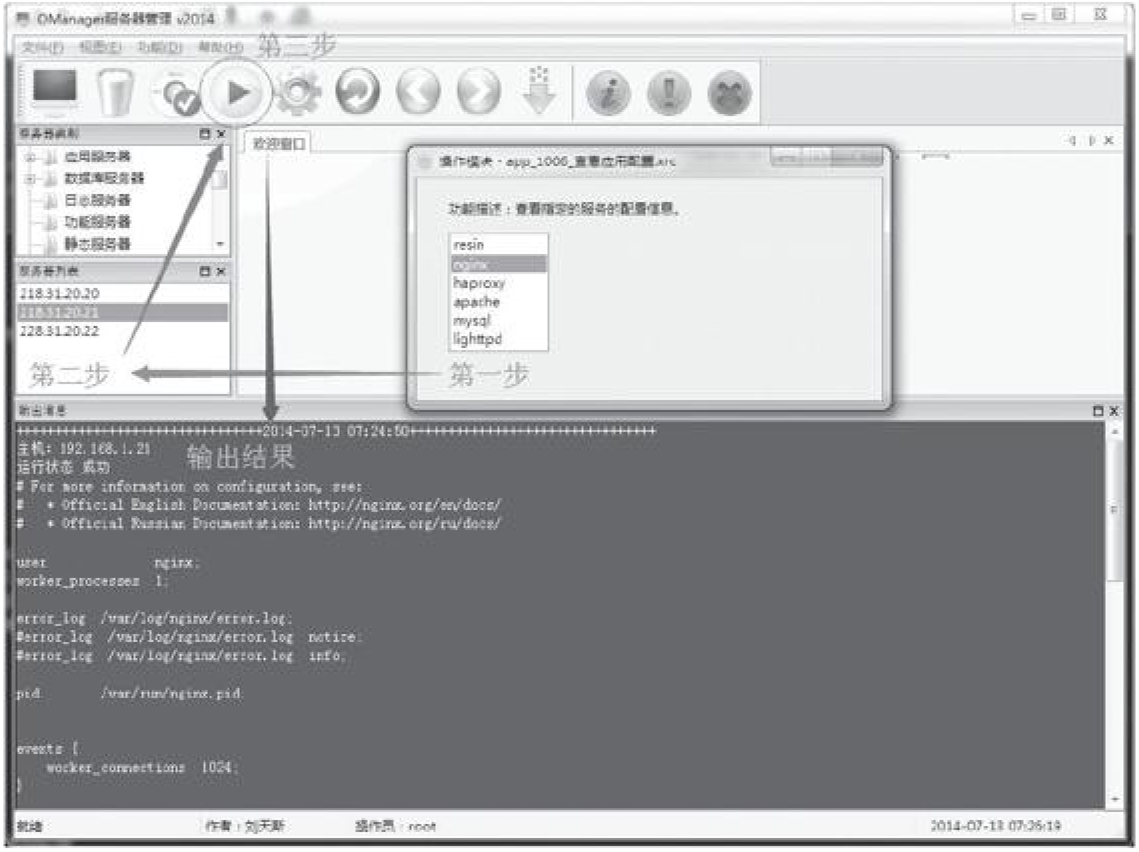


名称	修改日期	类型	大小
app_1005_同步应用文件.xrc	2014/7/2 6:59	XRC 文件	1 KB
app_1006_查看应用配置.xrc	2014/7/2 23:47	XRC 文件	1 KB
app_3200_YUM安装.xrc	2013/7/20 18:30	XRC 文件	1 KB
app_3201_硬件检查.xrc	2013/7/20 18:30	XRC 文件	1 KB
bas_1001_系统日志.xrc	2013/7/20 18:30	XRC 文件	1 KB
bas_1002_最新登录.xrc	2013/7/20 18:30	XRC 文件	1 KB
bas_1003_系统版本.xrc	2013/7/20 18:30	XRC 文件	1 KB
bas_1004_内核模块.xrc	2014/7/3 19:10	XRC 文件	1 KB
bas_1007_重启进程服务.xrc	2014/7/2 23:47	XRC 文件	1 KB
bas_3100_可控服务器.xrc	2013/7/20 18:30	XRC 文件	1 KB
bas_3105_监听端口.xrc	2013/7/20 18:30	XRC 文件	1 KB
bas_3106_系统用户.xrc	2013/7/20 18:30	XRC 文件	1 KB
bas_3107_系统组.xrc	2013/7/20 18:30	XRC 文件	1 KB
bas_3109_计划任务.xrc	2013/7/20 18:30	XRC 文件	1 KB
bas_3110_活动用户.xrc	2013/7/20 18:30	XRC 文件	1 KB
dba_3300_更新配置.xrc	2013/7/20 18:30	XRC 文件	1 KB
dba_3302_重启MySQL.xrc	2013/7/20 18:30	XRC 文件	1 KB
dba_3303_锁进程.xrc	2013/7/20 18:30	XRC 文件	1 KB
dba_3304_写语句.xrc	2013/7/20 18:30	XRC 文件	1 KB
dba_3305_检查备份.xrc	2013/7/20 18:30	XRC 文件	1 KB
mid_3500_消息服务.xrc	2014/6/29 22:23	XRC 文件	1 KB
ser_3400_后台分析检查.xrc	2014/6/29 22:23	XRC 文件	1 KB

[illegible]16-20 [illegible]XRC[illegible]

16.5.6 [illegible]

[illegible]OManager[illegible]16-21[illegible]



```
++++++++++++++++++++++++++++++++2014-07-13 07:24:50++++++++++++++++++++++++++++++++
主机: 192.168.1.21
运行状态 成功
# For more information on configuration, see:
#   * Official English Documentation: http://nginx.org/en/docs/
#   * Official Russian Documentation: http://nginx.org/ru/docs/

user              nginx;
worker_processes  1;

error_log  /var/log/nginx/error.log;
#error_log  /var/log/nginx/error.log  notice;
#error_log  /var/log/nginx/error.log  info;

pid        /var/run/nginx.pid;


events {
    worker_connections  1024;
}
```

□16-21　□□□□□□□□

□□□□□□□□□□□□□□OManager□□□□□□□□□□□□□□□□□□□OMserver□□□□□□□□□rpyc□□□RC4□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□13.5.3□□□□□□□□wxPython□□□□□□□□□□□□□□□□

```
try□

    conn=rpyc.connect□self._ip□int□self._port□□    #□□rpyc□
□□

    #□□login□□□□□□□□□□□□□□□

    conn.root.login
```

```
□'OMuser'□'KJS23o4ij09gHF734iuhsdfhkGYSihoiwhj38u4h'□

except Exception□e□

    message=u"□□□□□□□□□□□□□□□"+str□e□

    wx.MessageBox□message□u"OManager□□□□□□□□"□
style=wx.OK|wx.ICON_ERROR□

    return

#□□OnGetSelectServerinfo□□□□□□□□□□□□□□□□□□

_server_list=self.OnGetSelectServerinfo□'serverserial_ip'□
1□int□self._max_servers□□

#□□□□□□□□□□□□□□□□□□□□□□□□□

if not _server_list□

    return

#□□□□□□□Addsyslogs□□□□□□user_logs□□□□□□□□□□

Intologs.Addsyslogs□self.CurrentAdmin□u"□□□□□"+\

self.OnGetSelectServerinfo□'lip'□1□20□+u"-□□
MID□"+GetModelestrrow[0]□

#□□□□□□□□□“□□ID@@□□IP*□□□□N@@□□1@@□□2@@”

□□□“1001@@192.168.1.21*SN2013-08-021@@30@@”

put_string+=str□GetModelestrrow[0]□
+"@@"+_server_list+"@@"+Parameter_string

#□□tencode□□□□□□□□□□□□

put_string=FunApp.tencode□put_string□self._secret_key□

# #□□rpyc□Runcommands□□□□□□□□□□□□□□□tdecode□□□□□□OPresult=
FunApp.tdecode□conn.root.Runcommands□put_string□□
self._secret_key□.decode□'utf8'□

#□“□□□□”□□□□□□□
```

```
self.OnWriteMessageBox□FunApp.format_str□OPresult□□

conn.close□□
```

□□□“□□□□”□□□□□□□□□□SetInsertionPoint□0□□□□□□□□□□□WriteText□□□□□□□□□□□□□□

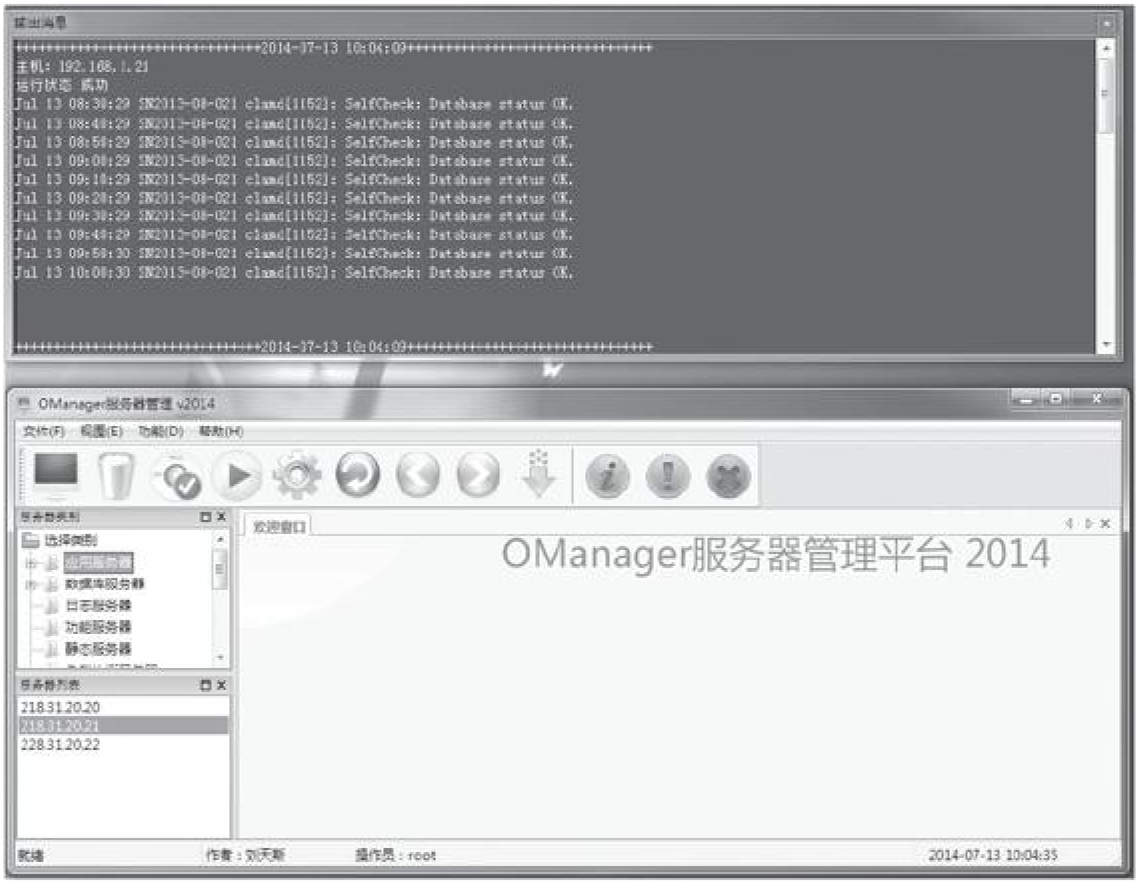
```
def OnWriteMessageBox□self□message□□

    t = time.localtime□time.time□□□

    st = time.strftime□"%Y-%m-%d %H□%M□%S"□ t□    #□□□□□□□□

    self.SysMessaegText.SetInsertionPoint□0□      #□□□□□□□
□□□□0□□□□□

    #□□□□□message□□□□□□□□□□□

    self.SysMessaegText.WriteText□"++++++++++++"+str□st□
+"++++++++++++++++\n"+message+"\n"□

    self.SysMessaegText.SetInsertionPoint□0□
```

□□□□□□□□□□□16-22□□□OManager□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

16.5.7 □□□□□□

□□□□□□□□Python□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□pyinstaller□http://www.pyinstaller.org□□□□□□□□□□□□□□□Linux□Windows□□□□□□□□□□□□□□□□

Pyinstaller 2.0□□□□□□□□□□□□□□□□□□□□bat□□□□□□



```
输出消息
++++++++++++++++++++++++++++++++2014-07-13 10:04:09++++++++++++++++++++++++++++++++
主机: 192.168.1.21
运行状态 成功
Jul 13 08:30:29 SN2013-08-021 clamd[1152]: SelfCheck: Database status OK.
Jul 13 08:40:29 SN2013-08-021 clamd[1152]: SelfCheck: Database status OK.
Jul 13 08:50:29 SN2013-08-021 clamd[1152]: SelfCheck: Database status OK.
Jul 13 09:00:29 SN2013-08-021 clamd[1152]: SelfCheck: Database status OK.
Jul 13 09:10:29 SN2013-08-021 clamd[1152]: SelfCheck: Database status OK.
Jul 13 09:20:29 SN2013-08-021 clamd[1152]: SelfCheck: Database status OK.
Jul 13 09:30:29 SN2013-08-021 clamd[1152]: SelfCheck: Database status OK.
Jul 13 09:40:29 SN2013-08-021 clamd[1152]: SelfCheck: Database status OK.
Jul 13 09:50:30 SN2013-08-021 clamd[1152]: SelfCheck: Database status OK.
Jul 13 10:00:30 SN2013-08-021 clamd[1152]: SelfCheck: Database status OK.


++++++++++++++++++++++++++++++++2014-07-13 10:04:09++++++++++++++++++++++++++++++++
```

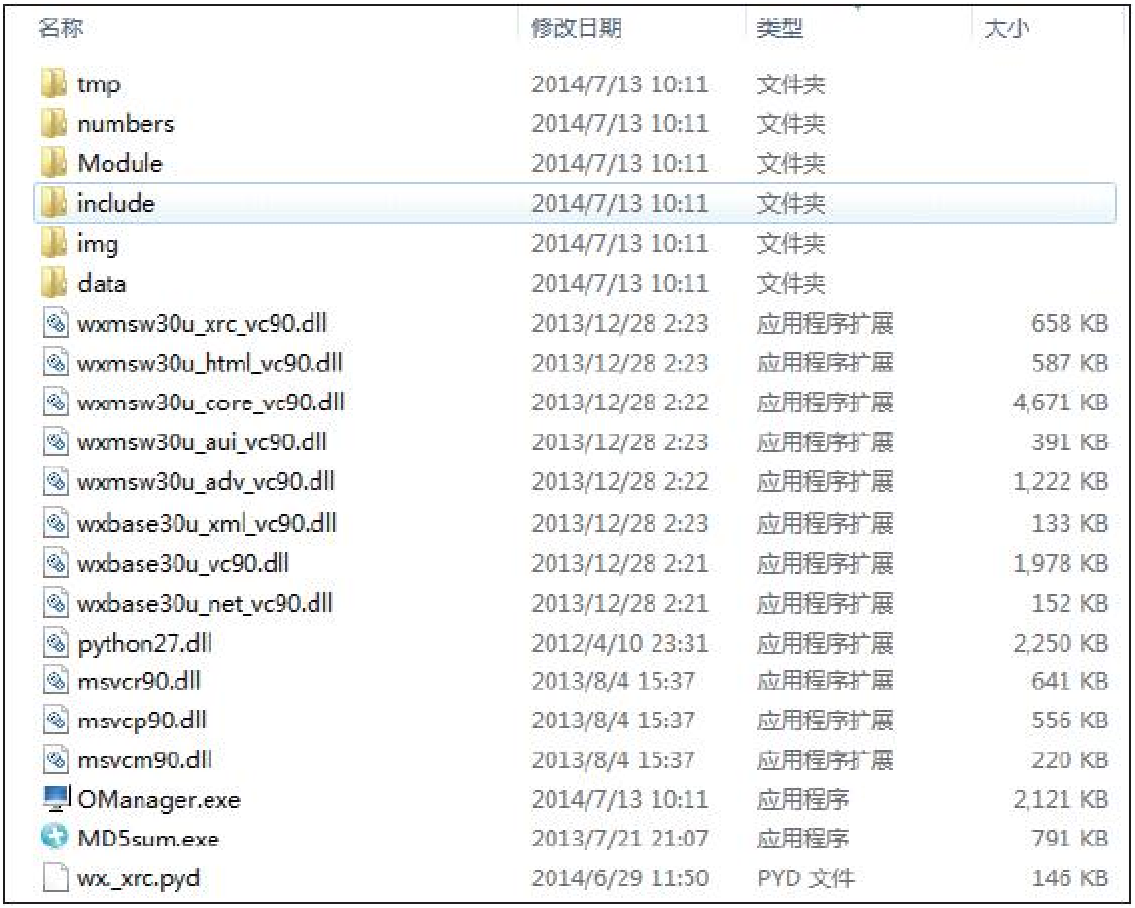
□16-22 □□□□□□□

□install.bat□

```
cd D□\python\OManager\OManager

d□

rd /S /Q dist

rd /S /Q build

del logdict2.7.3.final.0-1.log
```

```
python d[illegible]/soft/pyinstaller-2.0/pyinstaller.py --onedir -w -
-icon=img/imac.ico OManager.py

copy MD5sum.exe dist\OManager

xcopy /s data dist\OManager\data\

xcopy /s img dist\OManager\img\

xcopy /s Module dist\OManager\Module\

xcopy /s numbers dist\OManager\numbers\

xcopy /s tmp dist\OManager\tmp\

rd /S /Q build

rd /S /Q build

del logdict2.7.3.final.0-1.log
```

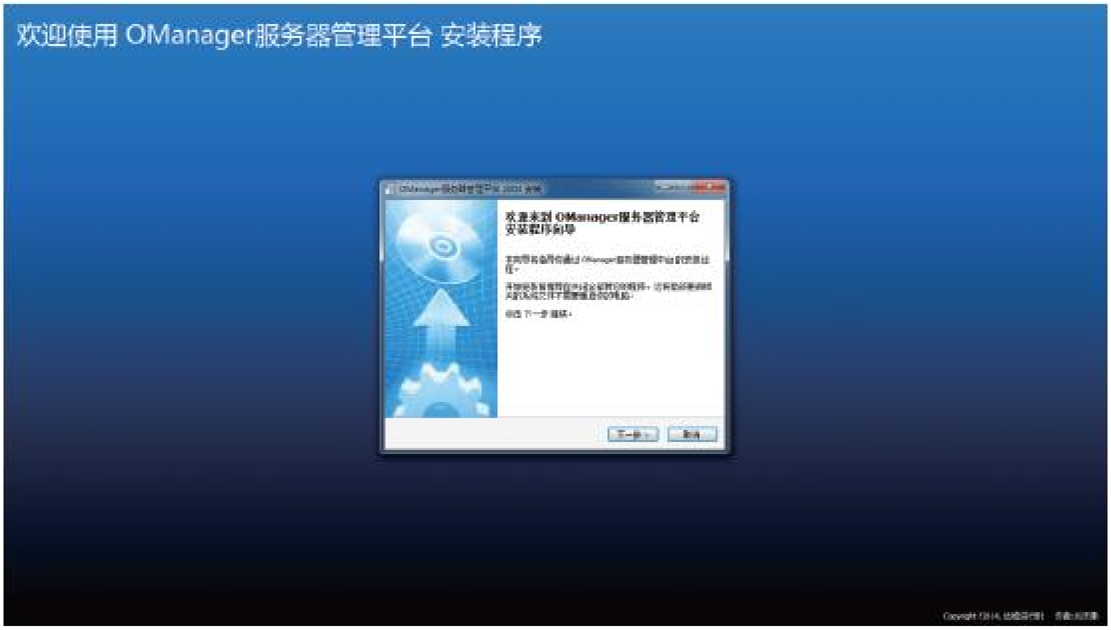
[illegible]“D:\python\OManager\OManager”[illegible]“--onedir”[illegible]exe[illegible]“-w”[illegible]“--icon”[illegible]“OManager.py”[illegible]xcopy[illegible]dist\OManager[illegible]16-23[illegible]



名称	修改日期	类型	大小
tmp	2014/7/13 10:11	文件夹	
numbers	2014/7/13 10:11	文件夹	
Module	2014/7/13 10:11	文件夹	
include	2014/7/13 10:11	文件夹	
img	2014/7/13 10:11	文件夹	
data	2014/7/13 10:11	文件夹	
wxmsw30u_xrc_vc90.dll	2013/12/28 2:23	应用程序扩展	658 KB
wxmsw30u_html_vc90.dll	2013/12/28 2:23	应用程序扩展	587 KB
wxmsw30u_core_vc90.dll	2013/12/28 2:22	应用程序扩展	4,671 KB
wxmsw30u_aui_vc90.dll	2013/12/28 2:23	应用程序扩展	391 KB
wxmsw30u_adv_vc90.dll	2013/12/28 2:22	应用程序扩展	1,222 KB
wxbase30u_xml_vc90.dll	2013/12/28 2:23	应用程序扩展	133 KB
wxbase30u_vc90.dll	2013/12/28 2:21	应用程序扩展	1,978 KB
wxbase30u_net_vc90.dll	2013/12/28 2:21	应用程序扩展	152 KB
python27.dll	2012/4/10 23:31	应用程序扩展	2,250 KB
msvcr90.dll	2013/8/4 15:37	应用程序扩展	641 KB
msvcp90.dll	2013/8/4 15:37	应用程序扩展	556 KB
msvcm90.dll	2013/8/4 15:37	应用程序扩展	220 KB
OManager.exe	2014/7/13 10:11	应用程序	2,121 KB
MD5sum.exe	2013/7/21 21:07	应用程序	791 KB
wx_xrc.pyd	2014/6/29 11:50	PYD 文件	146 KB

[illegible]16-23 [illegible]

[illegible]Advanced Installer[illegible]Inno Setup[illegible]Smart Install Maker[illegible]“Setup.exe”[illegible]16-24[illegible]



欢迎使用 OManager服务器管理平台 安装程序

欢迎来到 OManager服务器管理平台安装程序向导

□16-24 □□□□□□

□□□□ RC4□□□□□□□□
http://www.snip2code.com/Snippet/27937/Blockout-encryption-decryption-methods-p□

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